

DIGITAL DIVIDENDS AND OTHER PRO- POSALS TO LEVERAGE INVESTMENT IN TECHNOLOGY

HEARING BEFORE THE SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET OF THE COMMITTEE ON ENERGY AND COMMERCE HOUSE OF REPRESENTATIVES ONE HUNDRED EIGHTH CONGRESS

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DIGITAL DIVIDENDS AND OTHER PROPOSALS TO LEVERAGE INVESTMENT IN TECHNOLOGY

WEDNESDAY, NOVEMBER 19, 2003

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON TELECOMMUNICATIONS
AND THE INTERNET,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:36 a.m., in room 2322, Rayburn House Office Building, Hon. Fred Upton (chairman) presiding.

Members present: Representatives Upton, Cox, Whitfield, Shimkus, Walden, Terry, Markey, McCarthy, Towns, Stupak, Wynn, and Green.

Staff present: Jaylyn Connaughton, majority professional staff; Will Nordwind, majority counsel and policy coordinator, Neil Fried, majority counsel; Will Carty, legislative clerk; Turney Hall, minority staff assistant; and Gregg Rothschild, minority counsel.

Mr. UPTON. Well, good morning everyone. Today's hearing is entitled "Digital Dividends and Other Proposals to Leverage Investment in Technology." Specifically, we will be exploring proposals to put spectrum auction proceeds in special trust funds dedicated to the enhancement of technology in education.

As chairman of this subcommittee and as a member of the House Education and the Workforce Subcommittee on 21st Century Competitiveness, I visit a school every week in my district and have seen firsthand the tremendous impact which technology can bring to a student's learning experience. In today's global marketplace, we must equip our kids and workers of all ages with the high tech skills they need to remain competitive with the rest of the world's workforce and marketplace. Moreover, we need to make sure that our Nation remains on the technological cutting edge to maintain its educational and commercial leadership role in the world.

Today we are going to look at two concepts which are similar to the extent that they both would need Congress to set aside at least some proceeds from spectrum auctions into a special dedicated fund. In the case of the Digital Opportunity Investment Trust proposal, a significant amount, 30 percent, would be dedicated to digital, educational and technology programs among other things. In the case of the Telecommunications Development Fund, TDF, enhancement proposal, interest off a portion of winnings, bidders' down payments would be added to TDF's existing funding for investment in new technology ventures.

I would add I am the original cosponsor of Mr. Town's bill to do exactly that.

Both proposals have worthy goals, and I commend both Mr. Markey and Mr. Towns for focusing our attention on them. Under each of these proposals, we are generally talking about walling off spectrum auction proceeds from the normal budgetary process. It is through the normal budgetary process which those auction proceeds would otherwise flow to the Congress for use in our annual appropriations process.

In examining the Digital Opportunity Investment Trust proposal, we need to think hard about whether the worthy programs which would be funded through the Digital Opportunity Investment Trust might preclude funding for other worthy programs which might not otherwise get funded through the normal appropriation process such as veterans benefits, highway construction, homeland security, agriculture disaster support, among other things. Also I think we need to look at the entirety of Federal assistance to education and technology in whatever form it takes, whether it be grants, tax credits, loan guarantees or programs like E-rate to get a better sense of where we are in that regard.

Having said all that, I look forward to working with Mr. Markey and Mr. Towns and other members of this subcommittee to examine those issues, and look forward to hearing from today's distinguished witnesses, long-time friends.

And at this point, I yield to the distinguished minority member, ranking member of the subcommittee, Mr. Markey from Massachusetts.

Mr. MARKEY. Thank you, Mr. Chairman, and I very much appreciate your having this hearing that sets the table for future discussion on this issue. And I want to thank our witnesses for coming here today for this very important discussion. And obviously there is a lot of member interest in this subject.

When the Federal Communications Commission decides to proceed with auctions as a means of granting licenses to the public airwaves, I believe the public deserves to reap the benefits. These benefits should manifest themselves not only in the more rapid offering of new competitive commercial wireless services or the deployment of technological innovations, but also in the dividends that can be reaped by reinvesting the auction money wisely.

The legislation I have introduced, the Spectrum Commons and Digital Dividends Act proposes taking auction revenue and creating a permanent trust fund in order to fund grants for public interest telecommunications and educational technology initiatives. I believe harnessing this resource and reinvesting it for such initiatives will be vital to our national economic security, our homeland security and for leaving to the next generation the cultural and educational assets of our great country in an accessible digital form.

Economic security: United States is now in a post-NAFTA post-GATT world of fiercely competitive global markets, where a knowledge-based economy is the clear future for our country. Whether it is the training of teachers, retraining workers, supporting after-school computer literacy programs or other educational technology initiatives, we have to ensure that our future workers have the

skill set necessary to compete for and create the jobs America needs in order to succeed in a new global economic environment.

Homeland security: Moreover, in a post-September 11 world, our homeland security is tied to an educated and prepared military. After 9/11, we live in a world where local first responders and national law enforcement now have the task and must have the capability to fight sophisticated terrorists. In addition, our country will need its best minds to develop high tech tools to screen airliners, to test for biological or chemical toxins in the air or to thwart the designs of any cyber thugs who threaten our key infrastructure.

In civic cultural and educational legacy: Our Nation's libraries, museums, universities, are great repositories of information and possess the tremendous wealth of our cultural heritage. These treasures can and ought to be digitized in a way that makes them accessible to all our citizens, both on-line and over the air, using our National Public Broadcasting system. This will help to ensure that we have an informed and skilled citizenry for our civic institutions. Putting these great educational resources at the heart of the technological transformation our society is undergoing will strengthen our democracy in fundamental ways.

For all of these reasons, I believe we must rise to the challenge of funding advanced research and development for education and technology training in a way that reflects the urgent need to do so and the current and adequate resources being put to these efforts. Telecommunications technology has an awesome potential to effect change positively by driving economic growth, preparing our citizens for the tough challenges ahead and enriching our democracy. Yet without a plan, it will remain just that, merely the potential and promise, but not the reality. That is why I believe we ought to reinvest the auction resources we obtain from winning bidders in the public's airwaves. A permanent trust fund built from these funds will go a long way in meeting the need, and that is what my legislation is designed and intended to do.

I want to commend Mr. Newt Minow for his stellar work in this area, along with Mr. Larry Grossman who—working with Ann Murphy, each of them has played a role before this committee in the past. I also look forward to hearing from Dr. Eamon Kelly and Mr. James Welbourne in support of legislating such a trust.

In conclusion, allow me to also mention that I strongly support the Telecommunications Development Fund which was spearheaded by Representative Ed Towns and which I helped put into law in the Telecommunications Act. There is a program which creatively takes revenue from auction deposits before an auction is fully concluded and puts it to good use as seed money for small entrepreneurial companies.

And I commend Ginger Lew for her great work as well.

Again, I want to thank you, Mr. Chairman for calling this hearing and I look forward to hearing from our witnesses.

Mr. UPTON. I will remind my colleagues that under the rules of the committee, if you defer your opening statement from this point on, you will get an additional 3-minute incentive for questions.

Mr. Shimkus.

Mr. SHIMKUS. I cannot be bribed, Mr. Chairman. But let me—and I am going to be short.

First of all, to my friends here on the committee, December 4 will be the 1-year anniversary of signing of Dot-Kids. I never want to miss the opportunity to talk about Dot-Kids.us. We now have Smithsonian on; the State of Minnesota has the Dot-Kids.us site. Disney and PBS are moving to have sites on the Dot-Kids site. And I just use the bully pulpit to always talk about what I think is a great piece of legislation that is going to help in protecting kids.

And with that I turn to my chairman here and really the ranking member who was helpful in spearheading this, and I want to continue to do that. And I want to commend the two Eds on the other side of the aisle, Ed Markey and Ed Towns, for their vision and hard work on what to do when we move to auctions and where the money should go. I think it is a great debate. These issues need to be addressed in a public forum and I encourage them to continue to work diligently to help us work this through.

Mr. UPTON. We are likely to have an oversight hearing on Dot-Kids probably early next year.

Mr. SHIMKUS. Mr. Chairman, if I may, we are moving for the House server to make it available for members to get their own Dot-Kids sites up. Technologically, we are not there, but we are close. And then I would expect and encourage all Members of the House to have their own specific member site on the Dot-Kids.us server.

Mr. UPTON. No toy guns.

Mr. SHIMKUS. Maybe 1 or 2.

Mr. UPTON. Mr. Towns.

Mr. TOWNS. Thank you very much, Mr. Chairman. I would like to commend you and Ranking Member Markey. I thank you for holding this hearing today on innovative plans to invest in technology projects.

I would like to welcome the witnesses today, especially my friend Ginger Lew, the CEO of the Telecommunications Development Fund. Welcome.

Long before my career in Congress, I attempted to bridge what I call the economic opportunity gap in this country between the rich and poor, whether those rich or poor were in rural or urban areas. Throughout my tenure on this Commerce Committee and with the Information Age in full swing, I shifted much of my efforts to bridge the digital divide through programs that would increase minority ownership, put modern computers and equipment in schools to ensure that people in all parts of this Nation have access to the Internet.

Now that the spectrum and the proceeds from the spectrum seem to be growing by the day, there should be a healthy debate as to how best those moneys should be invested. I, for one, am for making sure that any leftover dollars are used for telecommunication projects such as education, increasing access to capital and broadband deployment in our schools. We put proceeds from the gas tax to the highway fund, so why not put money from various spectrum auctions toward improving our information highway? Makes sense to me.

Back in 1996, when the Telecommunications Act was being rewritten, a bipartisan group of members, including the current chairman and ranking member of the full committee, along with

others, founded the Telecommunications Development Fund as a way to assist those entrepreneurs in rural and underserved areas whose ideas showed promise, but lacked the capital to succeed in the modern day business environment. I am proud of the work that the TDF has done and continues to do, and want to thank my friends, Mr. Upton and Ms. Wilson specifically, for all their work on behalf of the fund, along with Congressman Markey from Massachusetts.

I would be remiss if I didn't mention that if H.R. 1320 were to be signed into law, it would be an incredible boon to the fund by lifting the burden of the Fair Credit Reporting Act from its shoulders. This is a common-sense bill that the Senate should enact promptly without the extraneous provisions added in the markup.

While it is not heard about as much today as it was a few short years ago, the digital divide is alive and well in this country. It knows no color or creed, but continues to separate the haves from the have-nots. Our constituents deserve better. And I hope, in addition to the ideas already on the table, that today some new ones will come forward as well. We need to focus on this digital divide, Mr. Chairman.

On that note, I yield back.

Mr. UPTON. Mr. Cox.

Mr. COX. Thank you, Mr. Chairman, and in particular for holding this important hearing on a very important topic. And I want to welcome our witnesses. Having read your testimony as you have submitted it, we are appreciative of your contribution to our understanding.

The Internet already is a very valuable educational resource, and it can become even more valuable, as can the attendant computer technology, if we simply encourage it in the right ways. This ought not to be simply a playground for grownups. This ought to be an opportunity for children and for students as well.

Roughly 150 million Americans live in homes with Internet access. That means that about 140 million Americans live in homes without Internet access. No matter how hard we work to enhance the value of educational resources on-line, those resources aren't going to do anything for those Americans who don't have access. Therefore, the top priority, increasing access to the educational resources on the Internet, has to be increasing access to the Internet.

The Pew Internet and American Life Project found that the major barrier for getting people on-line is the cost of Internet access. I hasten to point out that although the House of Representatives and this committee and the Judiciary Committee have done a splendid job in renewing the ban on special discriminatory taxes, such as Internet access taxes that threaten to expand the digital divide, that is now locked up over in the Senate, and we need to do everything we can this year to get the Internet Tax Non-discrimination Act passed into law. That is the No. 1 thing we can do to expand educational opportunities for kids and for all Americans on the Internet.

We need to do the same thing to allow students, especially young ones, with the Dot-Kids proposal that Mr. Shimkus described, to access the wealth of educational information and services that are already on-line, weed out those materials which have no edu-

cational value, no cultural benefits and no redeeming virtues. That means encouraging the development of technology that permits people who control the portal—not the government—people who control the portal—to make those decisions and working, for example, to achieve what is now the mere raw potential of Dot-Kids. That is the technical challenge for the hardware industry, the software industry and it is a legislative challenge for us.

As for the specific question of channeling spectrum auction proceeds to educational ventures, I think we would be wise to have a sense of humility here. As much as we all wish for a more education-oriented Internet, the money collected in spectrum auctions doesn't belong only to those of us who care about on-line education, only the companies that wish to deploy broadband or only the foundations focused on education or specific agencies of the government. These funds belong to all American taxpayers. So the potential uses of these funds must win out in competition with other priorities such as national defense, health care and the environment.

Government venture capitalist, government as the arbiter of technological winners and losers will succeed only in using taxes to distort marketplace competition and impede improvement in computer technology. We must do everything we can to improve the ways in which our schools and our students take advantage of the promise of technology. That means encouraging it in every way that we know how to improve as fast as it can. And it means keeping the cost down so the digital divide closes and more and more people have access.

Thank you, Mr. Chairman.

Mr. UPTON. Mr. Green.

Mr. GREEN. Thank you Mr. Chairman. I would like to ask unanimous consent to put the full statement in the record and just paraphrase it for the sake of time. I want to thank you and our ranking member for holding this hearing. And I would like to welcome our distinguished panel of witnesses, particularly Ms. Lew, to our committee.

Both the major proposals discussed in the submitted testimony aimed to make better use of our spectrum auction revenue for supporting technology investments, a goal I wholeheartedly support. Clearly, to free up the spectrum for auction, we have to be able to compensate government users, particularly the Pentagon, or else or we are going nowhere, as we have learned. Our committee in the House was able to pass the Commercial Spectrum Enhancement Act to do just that.

Revenues from spectrum auctions by the Federal Communications Commission in excess of compensation for government users should remain in the telecommunications field. We have already heard from other members about the success of the E-rate. There is continuing pressing need for public technology in our schools and libraries, and we need to continue to look at that.

The E-rate using universal service fund has been a primary source for lower income and rural schools and libraries to update their education resources so that school children have the skills necessary to succeed in today's economy. And I see this in every school in my district. The demand for this program has more than doubled its current funding cap. For year 5, last year's E-rate fund-

ing cycle, \$5.7 billion in applications was received for only \$2.25 billion in available funding; and many poor and urban and rural school districts would greatly benefit from the ability to use Federal technology for both products and services outside the current E-rate program.

It is great to be able to wire for telecommunications services and Internet access, but other information services and the equipment necessary to take advantage of them are too often out of the reach of millions of school children in our country. Maybe the future spectrum revenues can help fill the gap here and improve our future workforce, technology skills and, eventually, competitiveness in a global economy.

With that, Mr. Chairman, I yield back my time.

[The prepared statement of Hon. Gene Green follows:]

PREPARED STATEMENT OF HON. GENE GREEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

I want to thank Chairman Upton and Ranking Member Markey for the hearing we are having today on proposals to leverage investments in technology.

I look forward to hearing the various ideas from our distinguished panel of witnesses here today.

Both of the major proposals discussed in the submitted testimony aim to make better use of our spectrum auction revenues for supporting technology investments, a goal I whole-heartedly support.

Clearly to free up this spectrum for auction we have to be able to compensate government users, particularly the Pentagon, or else we are going nowhere.

Our Committee and the House was able to pass the Commercial Spectrum Enhancement Act to do just that.

Revenues from spectrum auctions by the Federal Communications Commission in excess of the funding necessary to compensate government users should remain in the telecommunications field.

There are certainly plenty of pressing public technology needs at our school and libraries that we should be looking to meet.

The E-rate program using Universal Service fund has been a primary funding source for lower-income and rural schools and libraries to update their education resources so that their schoolchildren will have the skills necessary to succeed in today's economy.

Demand for this program is more than double its current funding cap. For Year 5, last year's E-Rate funding cycle, \$5.7 billion in applications were received for only \$2.25 billion in available funding.

And many poor urban and rural school districts would greatly benefit from the ability to use federal technology support for products and services outside the current E-Rate program.

It is great to be able to wire for telecommunications services and internet access, but other information services and the equipment necessary to take advantage of them are too often out of the reach of millions of school children in our country.

Maybe future spectrum revenues can help fill the gap here and improve our future workforce's technology skills and eventual competitiveness in the global economy. I look forward to hearing from our witnesses on that topic.

I also look forward to hearing from our witnesses the number of ways we can also leverage funding for technology investments in small start-up businesses in underserved areas.

If we want to move the technology revolution in our economy across the digital divide, it won't be enough to invest in just in the schools and libraries, we need to find innovative ways to invest in entrepreneurs also.

Chairman Upton, Ranking Member Markey, I appreciate the hearing and yield back the balance of my time.

Mr. UPTON. Mr. Terry.

Mr. TERRY. Thank you, Mr. Chairman, and I do appreciate your holding this hearing. And welcome to our panel.

The digital divide in Nebraska is an interesting paradox in a sense, because in our one urban area that I represent, Omaha, Ne-

braska, in our core urban area, the poor area of town, they are wired. And the digital divide isn't accessed to the system per se. It is hardware. They can't go to Best Buy or Nebraska Furniture Mart and buy a computer for \$1,000.

That is why a community group—myself, Cox Cable, the Omaha Chamber—started a program where Omaha citizens and businesses can donate their PCs to our organization called Connect Kids; and then we work with the public schools, the Boys and Girls Club, Chicano Awareness Center, and so far we have been able to place hardware donated from businesses in 500 children's homes so they can access the Internet.

Once you get outside of the Omaha urban area, it is access to a system, especially advanced systems.

And so I think it is important for us, when we discuss the digital divide, to include not only urban areas, because I understand Omaha is a unique city in that it is a completely wired city. But we look at rural areas and wonder if we are going to leave those folks behind economically, educationally, if we do not have access to a more advanced system.

In that regard, I would associate myself with Congressman Cox's remarks about the importance of the Internet for educational use. I would add economic use. I would also say that I think it is incumbent upon this subcommittee, in particular, especially when we have two major RBOCs that have said they will roll out voice-over Internet protocol in order to take advantage of the "no taxes over the Internet" and avoid universal service. So I wonder if telephony in those types of communication and advanced systems will become the norm in a society but leave out core urban areas and rural areas if we don't get ahead of that curve as a Congress.

That is why today's hearing is important. It starts us thinking in that direction. It starts us thinking about the future. So I welcome the panel and yield back.

Mr. UPTON. Mr. Stupak.

Mr. STUPAK. Thanks, Mr. Chairman. I will be brief. Thanks for holding this hearing and thanks to Mr. Markey for his efforts on this issue.

As a member from a rural district, I wholeheartedly agree that the Internet offers opportunities that cannot be equaled in making education, culture, medicine and services available to all parts of the country and all segments of our population. For this reason, we must ensure that we maximize the availability of broadband, the utilization of the Internet and the education and training of all members of society to take advantage of this important tool.

I also share the belief that the FCC spectrum auction proceeds should be directed toward useful and rewarding purposes rather than being returned to general Treasury revenues. As a matter of fact, my colleagues, Vito Fossella, Eliot Engel and I, have introduced H.R. 3370, which would allocate a portion of the spectrum auction proceeds from the FCC to create a public safety trust fund.

I know many of my colleagues on the subcommittee have expressed strong support for assisting public safety with achieving interoperability and the ability to communicate with each other, with the hope that as we work in the future on this important digital divide proposal that we can also incorporate the worthy goal

of aiding public safety with their important lifesaving needs. There is much good that can be done with the spectrum auction proceeds and I look forward to legislative action on these proposals in the future.

With that, Mr. Chairman, I yield back the balance of my time.
Mr. UPTON. Ms. McCarthy.

Ms. MCCARTHY. Thank you, Mr. Chairman. I am going to put my remarks in the record. And I thank you for the hearing and thank Mr. Markey and Mr. Towns for their interest in this. And I am thrilled, as a former educator, that we can explore how to use technology to fund arts and cultural programs through the grants and funds that you promote in the legislation and that will really stimulate learning.

So I am excited that we have expert witnesses to speak to those changes in our policy, and I will yield back.

[The prepared statement of Hon. Karen McCarthy follows:]

PREPARED STATEMENT OF HON. KAREN MCCARTHY, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF MISSOURI

Mr. Chairman, thank you for convening this hearing. I want to express my appreciation to the expert panel here today and I look forward to their testimony.

I commend my colleagues, Mr. Markey and Mr. Towns, for their continued interest in the important issues before us, and for their leadership in drafting legislation.

As a former educator, I am deeply interested in how technology can improve our schools by funding arts and culture programs that stimulate learning.

Perhaps most urgently, I want to know how to use technology training to get this economy moving and to teach people the skills they need to not just earn a living, but to build a life.

Mr. Chairman, I welcome the panel's input on the creation of a national trust fund to make the nation's art, humanities and culture available to all Americans for lifelong learning. Let us all try to look at this issue with the shared goal of delivering the benefits of technology to our citizens, from young to old, from the classroom to the factory floor.

Thank you, Mr. Chairman, once again for convening this hearing and I look forward to today's testimony.

Mr. UPTON. I would announce all members of the subcommittee will have an opportunity to put their opening statements in the record.

Mr. Whitfield, do you wish to make an opening statement.

Mr. WHITFIELD. No, Mr. Chairman.

Mr. UPTON. You get the 3-minute bonus. You made it just in time. No brownies for anybody else.

[Additional statements submitted for the record follow:]

PREPARED STATEMENT OF HON. PAUL E. GILLMOR, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF OHIO

I thank the Chairman for the opportunity to examine spectrum management policies and the potential for greater technological development.

In one of the proposals before us today, we find the goal of allowing the Telecommunications Development Fund (TDF) to make loans in furtherance of the objective of enhancing small business and support services. Of particular interest to rural Northwest Ohio, this proposal would provide capital for small companies to foster growth and development in the increasingly important sector of broadband and wireless technology.

The second measure also serves as a worthy goal, promoting the continued advancement of opportunities to personnel at schools and libraries. The purpose of this proposal is to fund computer literacy programs, offer telecommunications services to individuals with disabilities, and fund educational software, among others.

I welcome the well-represented panel, look forward to hearing the testimony of the witnesses, and anticipate a positive debate regarding these and other proposals that would further the impact and reach of telecommunications on our society.

Again, I thank the Chairman and yield back the remainder of my time.

PREPARED STATEMENT OF HON. BARBARA CUBIN, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF WYOMING

Thank you, Mr. Chairman.

I would like to thank you for holding this hearing to examine a different "state of telecom," not the health of the industry that we analyzed earlier this year, but through a more granular focus, we are going to hear testimony about ways to avoid a gulf between technology haves and have-nots.

As our nation continues its evolution toward a fully wired and "paperless" economy, and where a great deal of government-related services have now migrated to an electronic platform, the need for an Internet-savvy citizenry is increasingly important. After all, the speed and efficacy of the Internet in disseminating information creates efficiencies that millions of federal workers cannot duplicate. This, of course, translates to substantial future fiscal savings and improved federal services.

I'm somewhat dubious, however, as to what role Congress in general and the Committee specifically, play in this matter. Some of my colleagues endeavor to have a cradle-to-the-grave government care model, and think everything is a federal responsibility, while I and others believe in the preservation liberty and self determination. Somewhere in there lies the mutual obligation of taxpaying Americans to fund initiatives for the public good.

There is no end what folks would like to do, only if they had federal money with which to do it. I know because I see them all the time here in Washington, and it makes me wonder sometimes how anything got done prior to federally-funded programs like the National Endowment for the Arts (NEA). Clearly there are no instances of masterpieces created prior to 1965 when the government came to the rescue with the creation of the NEA.

Nevertheless, as a Member representing rural Wyoming, where the Internet keeps us connected to the rest of America, I have a great deal of interest in ensuring e-commerce is a vibrant and accessible component of our economy. Also, I look to our educational institutions and job training programs such as the Workforce Investment Act as the vehicles to provide lifetime education and other services, not creating more self perpetuating, often duplicative and forever growing federal programs.

We have the opportunity in today's hearing to determine the proper place and funding mechanisms for digital outreach and hear from this distinguished panel their assessment of where we are, and where we need to go.

Thank you Mr. Chairman, I yield back the balance of my time.

Mr. UPTON. We are delighted to have the panel that is with us today. And I looked at the testimony last night. I would note that the testimony is part of the record. We will allow you each to summarize it in a 5-minute period. There is a little clock, that should be working, in front of you. Is that actually on? Because the lights on this side are not on.

We are delighted to have Mr. Newt Minow, former Chairman of the FCC and Senior Counsel with Sidley, Austin, Brown & Wood from Chicago; Dr. Eamon Kelly, Professor of International Development at the Payson Center for International Development and Technology Transfer at Tulane University; Mr. James Welbourne, Director of the New Haven Free Public Library System, the American Library Association here in Washington; and Ms. Ginger Lew, CEO of the Telecommunications Development Fund, also here in Washington.

Mr. Minow, we will start with you.

STATEMENTS OF NEWTON N. MINOW, SENIOR COUNSEL, SIDLEY AUSTIN BROWN & WOOD; EAMON M. KELLY, PROFESSOR OF INTERNATIONAL DEVELOPMENT, PAYSON CENTER FOR INTERNATIONAL DEVELOPMENT AND TECHNOLOGY TRANSFER, TULANE UNIVERSITY; JAMES WELBOURNE, DIRECTOR, NEW HAVEN FREE PUBLIC LIBRARY SYSTEM, c/o AMERICAN LIBRARY ASSOCIATION; AND GINGER EHN LEW, CHIEF EXECUTIVE OFFICER, TELECOMMUNICATIONS DEVELOPMENT FUND

Mr. MINOW. Mr. Chairman, Mr. Markey, members of the committee, my statement is submitted for the record.

Coming here this morning and walking into the Rayburn Building reminded me of the day I started as Chairman of the Federal Communications Commission many years ago. I went to see the then-Speaker of the House, Mr. Rayburn, whom I had met, and we talked; and he said, Young man, son, he said, you and I will get along just fine if you remember one thing. I said, What is that, sir? He said, You work for me. And I never forgot it, because the FCC, as you know, is an arm of the Congress, and I testified before this committee so many times.

There was a Congressman in the 19th century who served 43 years in the Congress and the Senate. He was a Republican from Vermont. He was an uneducated farmer. His name was Justin Smith Morrill. He made a major contribution to this country because he suggested in the 1860's what became the Land Grant College Act. The Land Grant College Act was defeated time and time again in Congress, but finally during the Civil War, it was passed. And Abraham Lincoln signed it as President. The Land Grant College Act, unlike the laws Congress passes today, was as big as my hand. That was the entire law. But it changed American history, because the law said that each State would receive 30,000 acres of federally owned land for each Member of Congress and each Senator on the condition that the State would create a land grant college.

At that time the people who went to colleges and universities in America were white males studying to be a lawyer, doctor or minister. Nobody else. No women, no minorities. And the result of the land grant college law, which now has 105 land grant colleges in the United States, the whole California system, great universities like Cornell and MIT, all got their start as land grant colleges because in the midst of the Civil War the Congress decided that an investment in education in the form of land would benefit the country. That was in the 19th century.

In the 18 century we did the same thing. When this country first started, we created public schools by using land. The Northwest Ordinance provided that Federal land would be set aside for schools.

In the 20th century, by a one margin vote in the House of Representatives—let me emphasize that, a one margin vote in the House of Representatives—in the midst of World War II, the GI bill was passed, one vote. The GI bill enabled millions and millions of Americans who would never have gone to college, who would never have had a higher education, to go to school to become productive

citizens of our society. Those are the 18th, 19th, 20th century precedents.

What are we going to do in the 21st century? The 21st century, I would submit, is the equivalent of land today, federally owned land, as something we can't see. It is in the airwaves. And as Congressman Cox said, it belongs to every single one of us. It doesn't belong to the people who use it. It belongs to every single one of us.

And we started, and Congress provided, to auction off the airwaves years ago and it provided a enormous amount of money nobody thought was possible, billions upon billions of dollars. The money, however, was not designated for any particular use, unlike the Northwest Ordinance, unlike the Land Grant College Act, unlike the GI bill, the money simply went into the Federal Treasury where it evaporated in a matter of hours. Instead of going for investors' lifetimes, it was gone, poof, in a matter of hours.

That is why, we think—Larry Grossman and I were asked 3 years ago by a group of foundations to address the question, what does this revolution, this digital revolution, what opportunities are there for the not-for-profit sector, for the schools, for the libraries, for the universities. And we developed and we went around the country and talked to a lot of people, interviewed many people and talked to many scholars, people who weren't scholars; and we wrote a book and we came up with this proposal, the Digital Opportunity Trust.

We think that it is imperative in the world we are going into that everybody have an opportunity to participate in this communications revolution, this digital revolution, this technology revolution. I happen to chair an advisory committee for the Department of Defense on privacy and modern technology. In fact, we are meeting here, and our meetings are in the Senate tomorrow and Friday. And I have learned a lot about technology as a result of that.

There is no question that we are only at the beginning. We are only at the beginning of what this is all about. And I believe—and am very grateful to you, Mr. Chairman, and I know you have a deep interest in the area of technology and education. Think what it would mean at Benton Harbor if these kids all had a chance to participate in this.

And to you, Congressman Markey, who has taken a lead in this, we are very grateful, because we think—and there is legislation pending in the Senate as well as the House—we think this is a magnificent opportunity.

I was very discouraged with the economic situation, and we realized after 9/11 that the problems of the budget would be greatly affected, but we still say that this investment, just like the Land Grant College Act, just like the GI bill, just like the Northwest Ordinance, is going to make history for this country; and we ask you to be the makers of that history.

[The prepared statement of Newton N. Minow follows:]

PREPARED STATEMENT OF NEWTON N. MINOW

DIGITAL OPPORTUNITY INVESTMENT TRUST: PROGRESS TOWARD THE PROMISE

Thank you Mr. Chairman, Congressman Markey and distinguished Members of the Committee. Thank you on behalf of myself and my friend and Co-Chairman of

the Digital Promise Project, Larry Grossman who spoke before the Committee on this subject last spring. We are both very appreciative of this opportunity to be here today to give you information about current developments in the work we have been doing. It has been a pleasure working with the excellent members of your staff. We hope that this hearing engenders a comprehensive discussion of the Digital Opportunity Investment Trust and we look forward to your comments and questions.

First, let me summarize our proposal. We seek to create a Trust for the American people that will transform teaching, learning and training for the 21st Century. This Trust that we call the Digital Opportunity Investment Trust or DO IT, draws inspiration from several sound and highly successful examples. DO IT will be an incubator for ideas, research and development of advances in education and training in the same way that the NSF functions for science or the NIH functions for health and medical science. My esteemed colleague and former Chairman of the National Science Board, Dr. Eamon Kelly will elaborate on the parallels we have drawn with the NSF. What is clear is that the disciplines of education and training must be given the same level of priority and benefit of raw American ingenuity and academic genius if we are to remain at the vanguard of competitiveness as a nation and retain a healthy and just society.

The Need

Let me take a step back first, to how the concept of a Trust to transform teaching and learning for the 21st Century came about. Three years ago Larry Grossman, whom you know as a former president of NBC News and the Public Broadcasting Service, and I started talking about the information and revolution through digital technology. Larry and I have spent the measure of our careers embroiled in the issues of communications technology and helping to create and oversee the content that technology provides to millions of Americans. We looked at the information revolution taking place in our society over the past twenty years and we saw that the fruits of the new digital era were not automatically shared widely by non-profit, public service, educational and cultural institutions. The institutions in question are those charged with being the repositories for the scientific, cultural and historical DNA of our country.

In addition, we saw that education and training, rather than being at the epicenter of this technological revolution, were suffering from inadequate resources and too often playing "catch up" to the commercial marketplace. The long-term effects of continuing to give education and training a back seat in the digital era would only grow more staggering with time. We envisioned the creation of the Digital Opportunity Investment Trust that would serve as a venture capital fund dedicated to innovation and research in using new technologies to transform education, training and lifelong learning for all Americans.

While our country struggles to get Democracy to thrive in other places; I submit that we should also take a profound look at what we need to keep our Democracy thriving right here at home. The answer is that Democracy thrives when an educated citizenry has access to information and the critical thinking skills to make informed choices. Education is the cornerstone of our Democracy, and technology is rapidly becoming the primary vehicle for education and lifelong learning. We must use technology for improved education and training or we will pay a price we cannot afford.

In the global knowledge economy of the 21st Century, education and training equals jobs. As the manufacturing and manual labor base of our workplace erodes, the jobs that allow people to be productive and self-reliant members of society rely on the proficient use of information technology. Other nations are quick to exploit the transient nature of global labor markets and now some of America's largest companies employ IT service workers in other countries or end up importing special visa holders because they cannot recruit qualified American IT workers.

DO IT would ensure that our education system provides all students with a world-class education system that fully integrates technology and learning. And, DO IT would develop a structure for the delivery of training materials to workers in all fields so that Americans would be technologically capable to fill those high-paying IT jobs even at the mid-points in their careers. DO IT would also make America's growing population of seniors a priority. As life expectancies grow for a greater-than-ever portion of the population we must ensure that productivity and self-reliance is possible for seniors as well. Technology is the key to life-long learning and productivity which will be fundamental for our society to remain economically viable as more than 70 million Americans will be over the age of 65 by the year 2030.

Another staggering need that must be addressed through the kinds of education research and training that DO IT would provide is that of national security. Here, I quote the report titled *The U.S. Commission on National Security in the 21st Cen-*

ture, chaired by former Senators Warren Rudman and Gary Hart. Now known as the “Hart-Rudman Report” it warns that, “the inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine. American national leadership must understand those deficiencies as threats to national security. *If we do not invest heavily and wisely in rebuilding these two core strengths, America will be incapable of maintaining its global position long into the 21st Century.*” And this dire warning, I will add, was issued prior to September 11th 2001 and the imposing array of challenges revealed for training first-responders and citizens in the face of far-reaching emergencies.

I could also quote from various reports such as Congress’s bipartisan Web-based Commission, President Bush’s Technology Advisory Commission, the Department of Commerce’s “2020 Visions” Report, the Business-Higher Education Forum, among others, that all point to the same thing: we must put advanced research and development for education and training at the vanguard of our priorities if America is to remain competitive in the world, **and our current systems and resources are inadequate.** The question is: when will we act? When will we streamline and coordinate all of the disparate federal initiatives currently taking place and apply research gains where appropriate and bring programs to scale? When will we make the kind of investment that matches this enormous and imperative need?

Status of our Proposal

We have a clear mission that is supported by a broad coalition of respected public and private entities including hundreds of universities, corporations, museums, libraries, civic and cultural organizations, labor unions, organizations for senior citizens and leading members of the education, arts and workforce development communities, and the Conference of Mayors. (A list of our coalition members has been submitted with this testimony). Our research has been conducted and corroborated by individuals and entities from across the political spectrum, including a major summit hosted by the Secretaries of Commerce and Education at the Department of Commerce last fall. We also went to the next generation of leaders to get their ideas. I am submitting for the record the winning papers in a call issued by the Digital Promise and the Learning Federation. These papers written by students from Florida and Hawaii expand on but two of the kinds of proposals that could be developed by DO IT. In the spring of 2003, through PL 108-7, Congress asked us to produce a detailed report on our recommendations for the creation of DO IT. This report includes a detailed rationale, a proposed structure and governance plan as well as a specific research and development roadmap that will lead to the kind of innovations in scientific applications for teaching and learning that are so vital to the improvement of education in our country. We formally presented the Report to Congress last month. Senators Dodd and Snowe, along with Senator Durbin, have subsequently introduced S-1854 titled “The Digital Opportunity Investment Trust Act.” Today, we are called to discuss legislation pending before this Committee that has been introduced by Congressman Markey and calls for the creation of a Trust that provides “digital dividends” for many of the same critical purposes outlined in our report.

Our Nation’s Legacy

Congress has made this kind of investment in the past. We have history to lean on to understand, that even in times of great adversity, Congress has had the far-sighted wisdom to fortify our society for future generations by investing in education.

In the period following the American Revolution, Congress passed the Northwest Ordinance that set aside public land whose revenues would support the creation of public schools in every new state. This was the genesis of the nation’s pioneering system of public education.

During the darkest days of the Civil War, again using the valuable asset of public land, Congress passed and Abraham Lincoln signed the Land Grant Colleges Act of 1862. It provided for the sale of public lands to support the establishment of a public college and university in every state, so that higher education would be accessible to farmers and workers, not just to the elite and wealthy few. Today, the nation’s system of 105 land-grant colleges provides the foundation of American higher education, and its creation heralded America’s economic ascendancy into the industrial age.

In the midst of World War II, Congress made its third transformative public investment in education. It passed, and President Roosevelt signed the GI Bill which sent millions of American service men and women to college. The prosperity and security that followed in the wake of the GI Bill helped America become the world’s

economic and political leader. The wisdom of the nation's innovative investments in education in times of crisis has been borne out in each century of the nation's history.

Today we stand at another crossroads. It is a time of great uncertainty in our history, and we face the sweeping changes of the information age. The citizens who are best equipped to meet the challenges of this new age are those who have access to information technology and who have dexterity in using technology as a working and learning tool throughout their lives. It will be costly to ensure that all of our people are ready to meet those challenges—how can we pay for it?

As we developed the Digital Promise proposal, we looked to history for the precedent of how to fund such an intensive investment in education, and there is a sound model that has been accepted and supported by the American people. In the cases of the Northwest Ordinance and Land Grant Colleges Act, Congress enabled major investments in public education to be made through the proceeds from the public asset of land.

Today, the public asset in question is the highly valuable electromagnetic spectrum. It is the equivalent of the bountiful public lands of times gone by. We recommend that the Digital Opportunity Investment Trust be created through a portion—a percentage only—of the revenues from the sale, auctions and/or fees from the public asset of the public airwaves. Even a small percentage of such revenues over a specified and reasonable period of time would allow for an endowment that would secure enormous benefit for future generations.

The model for a Trust from spectrum revenues is also not new. The Minorities in Telecommunications Fund that is also under review in this hearing was created through an initiative by Congress to ensure equal access to capital for minority held telecommunications businesses. The creation of this trust proved that revenues from the spectrum could be Congressionally mandated to be moved into a trust for a higher purpose within the parameters of the annual budget and appropriations cycles. The Digital Opportunity Investment Trust would be created through this same tested financial mechanism that would allow for a portion of spectrum revenues to be placed in an interest bearing account. This Trust would be governed by a Board appointed with the advice and consent of Congress and the President and Congress would examine and evaluate the Trust's performance and approve its budget and activities.

The Opportunity for Leadership

In closing, I respectfully submit that yours is the helm as we face this next great task. We have worked diligently with the members of our coalition and a small staff to move this vision forward. But the true opportunity for leadership lies in your hands. You will be in very good company; President Thomas Jefferson, Senator Justin Morrill, President Lincoln and President Franklin Roosevelt saw to fruition the investments in education that enabled previous generations to prosper and to move America into a position of leadership in the world. The Digital Opportunity Investment Trust is the next such great and pivotal investment to be made for the sake of generations to come. It is clear that these ideas have been given serious thought by Congressman Markey, and I know that you, Mr. Chairman, have a dedication to using technology to improve education. We look forward to working with you and your staffs in developing proposals that will transform learning environments in this country and worldwide. Thank you again for inviting me to testify today. I would be happy to answer any questions at this time.

Mr. UPTON. We appreciate your testimony and your interest and remember it was one of the first discussions you and I had several years ago at length in my office.

Mr. Kelly. Welcome to the subcommittee.

STATEMENT OF EAMON M. KELLY

Mr. KELLY. Thank you, Mr. Chairman, Congressman Markey and distinguished members. I appreciate the opportunity to testify before you in support of the Digital Opportunity Investment Trust. I previously have served as Chairman of the National Science Board from 1998 to 2002, and I would like to begin by thanking the committee for its long-term commitment to ensuring that the citizens of our country can share equally in the services made available by

advanced telecommunications and have an opportunity to participate in the development of a strong and vibrant economy.

I have been a supporter of the Digital Opportunity Investment Trust or DO IT from the beginning. As alluded to by the digital promise report to the Congress, the DO IT will do for education and training what NSF does for science.

Let me explore from my vantage point as past Chairman of the National Science Board some of the parallels between the National Science Foundation and DO IT and explain why DO IT is so vitally important to our Nation at this point in time.

In the past two decades, our knowledge has expanded at a rapid rate. Our world has grown more complex. Knowledge is now the principal source of wealth creation and new jobs in the U.S. And globally. This new knowledge-based economy has brought significant changes with profound implications for society. It has placed new demands on education and training for all of our citizens, not just K through 12 schooling, but throughout a person's lifetime. There is a critical need for an educational paradigm that reflects the needs of a diverse population and addresses all aspects of life-long learning. DO IT will address this important need.

The overarching objective of DO IT is one vital to our Nation's prosperity, to encourage, educate and enlist citizens into jobs and professions that drive the new knowledge economy, contribute to social well-being and safeguard the basic values of our society. DO IT will be an incubator for innovation playing a role similar to that of the National Science Foundation to nurture the people, ideas and tools needed to generate new scientific knowledge and new technologies. Federal investment in the basic sciences through the National Science Foundation have produced many benefits, including new industries such as E-commerce and biotechnology, new medical technologies, such as MRI and genetic mapping, new discoveries in areas such as nanotechnology, cognitive neuroscience and biocomplexity. Similarly, DO IT will intensify and focus research and development to harness the power of advanced technology to improve learning.

This is an area of R&D that is greatly underfunded given its importance to our Nation. Unfortunately, the practices recommended by educational psychologists and cognitive scientists are not pervasive in our country's classrooms and training centers. Individualized instruction, subject matter experts and rich curricula activities are often simply too expensive.

Emerging technologies make it practical now to approach learning in ways that learning scientists have advocated for many years. But we can achieve this goal only by undertaking a long-term, large-scale effort to develop tests and disseminate tools for building advanced learning systems.

The R&D supported by DO IT will lead to a wide range of learning content and software tools that can lower the cost of entry for educational materials and assistance. This will enable vastly improved learning systems to become routinely available to all Americans inside and outside of the classroom in both urban and rural communities.

The funding programs supported by DO IT will develop a pipeline of well-educated researchers to contribute to this important

field. Some of these researchers will become faculty members and help educate future generations of researchers. Many others will join the workforce to develop next-generation products and services to contribute to U.S. Leadership in the education and training sector in areas such as E-learning services and educational software.

Mr. Chairman, I am convinced that the 50-year-plus legacy of the National Science Foundation has been the driving force in the overall leadership of the United States in the fields of science and technology. The nature of the world we face today requires that the same kind of incubation of ideas and innovation in the areas of education and training if we are to remain competitive on a global level.

My experience as past Chairman of the National Science Board gives me every confidence that an entity such as DO IT can be effectively governed and structured to achieve these goals and to be thoroughly accountable to Congress and to the public trust.

At this point, I would like to close my formal remarks. I thank the committee for allowing me to comment on the Digital Opportunity Investment Trust. I look forward to future opportunities for discussion of this highly important national initiative. Thank you. [The prepared statement of Eamon M. Kelly follows:]

PREPARED STATEMENT OF EAMON M. KELLY, FORMER CHAIRMAN, NATIONAL SCIENCE BOARD

INTRODUCTION

Thank you Mr. Chairman, Congressman Markey, and distinguished Members of the Committee. I appreciate the opportunity to testify before you in support of the Digital Opportunity Investment Trust. I am Eamon Kelly, President Emeritus and Professor in the Payson Center for International Development & Technology Transfer at Tulane University. I served as Chairman of the National Science Board from 1998-2002.

I would like to begin by thanking the Committee for its long-term commitment to ensuring that the citizens of our country can share equally in the services made available by advanced telecommunications—enhanced ways to communicate, learn, do business, and be entertained. The strength of our democracy has rested from the start on the principle that we are a land of opportunity enabled by an extraordinarily diverse citizenry. But in our technologically sophisticated society, fast-paced change often puts the most expansive opportunities out-of-reach for many. The Committee's groundbreaking work on legislation that provides for innovation in and expanded access to high speed Internet services has contributed greatly to assuring that all Americans have an opportunity to contribute to the development of a strong and vibrant economy.

I have been a supporter of the Digital Opportunity Investment Trust, or DO IT, from the beginning. As alluded to by the Digital Promise report to the Congress, DO IT will do for education and training what NSF does for science. Let me explore from my vantage point as past National Science Board Chairman some of the parallels between the National Science Foundation and DO IT and explain why DO IT is so vitally important to our Nation at this point in time.

THE NEED FOR AN EQUIVALENT EDUCATION AND TRAINING EFFORT AS FOR SCIENCE

As the members of this Subcommittee know so well, something new and exciting is happening in the 21st century. We are in the midst of a new era of discovery, learning, and innovation. In the past two decades, our knowledge has expanded at a rapid rate; our world has grown more complex. Knowledge is now the principle source of wealth creation and new jobs in the U.S. and globally. This new knowledge-based economy has brought significant changes with profound implications for society. It has transformed the way we live and work.

These truths of our times and our broader national values demand that we embrace the imperative of preparing people to take advantage of these opportunities. We are talking about opportunities not only for individuals. We are also talking about ways to create expanded opportunities for the U.S. to compete and prosper.

Education and training have always been vital to the success of individuals. In today's knowledge-based economy, it is also an investment in our collective future as a nation and a society. The knowledge-based economy has placed new demands on education and training for all our citizens—not just K-12 schooling, but throughout a person's lifetime. There is a heightened sense of urgency to the task of identifying new learning and institutional strategies that will open the door to economic prosperity and improved well-being to the full diversity that is the face of America.

The National Science Foundation (NSF) focuses on building and sustaining a competent and diverse scientific, mathematics, engineering, and technology workforce. The scientific and technological leadership enjoyed by the U.S. today, is due in large part to the funding and programs of the NSF. There is also a critical need to for an educational paradigm that reflects the needs of a diverse population and addresses the humanities, the arts, workforce training, and all aspects of lifelong learning. DO IT will address this important need. The overarching objective of the Digital Opportunity Investment Trust is one vital to our nation's prosperity—to encourage, educate, and enlist citizens into jobs and professions that drive the new knowledge economy, contribute to social well being, and safeguard the basic values of our society.

DO IT AS AN INCUBATOR FOR INNOVATION

The NSF plays a vital role in nurturing the people, ideas, and tools needed to generate new scientific knowledge and new technologies. Federal investments in the basic sciences through the National Science Foundation have produced many benefits, including:

- New industries, such as E-commerce and biotechnology,
- New medical technologies, such as MRI and genetic mapping,
- New discoveries with great future promise in areas such as nanotechnology, cognitive neuroscience, and biocomplexity.

NSF has accomplished this by funding innovative, peer-reviewed science and engineering research, educating a highly skilled science and engineering workforce, and building partnerships with other federal programs, non-profits and industry to foster transfer of knowledge, methods and tools.

DO IT will play a similar role to foster a community of researchers and developers. DO IT will give academia, non-profits and industry the resources to develop learning content, methods, and models that will provide learners, teachers, and instructors with new tools. Some tools will be as basic as interactive digital aids to reading, writing, math, and languages, and some will be as sophisticated as simulations, visualizations, and distributed collaborative projects. Given an aggressive and successful program of research, computer simulations could let learners tinker with chemical reactions in living cells, practice operating and repairing expensive equipment, or evaluate marketing techniques. Simulations could make it easier to grasp complex concepts and transfer this understanding quickly to practical problems. New communication tools could enable learners to collaborate on complex projects and ask for help from teachers and experts from around the world. Learning systems could adapt to differences in student interests, backgrounds, learning styles, and aptitudes. They could provide continuous measures of competence, integral to the learning process. Such measures could help teachers work more effectively with individuals and leave a record of competence that is compelling to students and to employers.

The gap in student achievement is a major challenge before us and one that is central to the new No Child Left Behind legislation. Without new models and tools for teaching and learning, we are stuck in classrooms that haven't changed much since the turn of the last century, educating our children on an agrarian calendar schedule, with methodologies that do not fully integrate and utilize the technology that permeates every other sector of our lives. Imagine the impact that the ability to refine teaching techniques could have in truly changing outcomes when each child has a personalized learning plan, customized through technology, to meet his or her specific learning style. High student to teacher ratios, often the case in failing schools, would then not be such an impediment and testing would become much more capable of aiding learning. And new tools could allow continuous evaluation and improvement of the learning programs and systems.

DO IT will intensify and focus R&D to harness the power of advanced technology to improve learning. This is an area of R&D that is greatly unfunded given its importance to our nation. President's Committee of Advisors on Science and Technology (PCAST) in its *Report to the President on Educational Technology* (1997) reported that in 1995 the U.S. spent about \$70 billion on prescription and non-prescription medications, and invested about 23% of this amount on drug develop-

ment and testing. By way of contrast, our nation spent about \$300 billion on public K-12 education in 1995, but invested less than 0.1% of that amount to determine what educational techniques actually work, and to find ways to improve them.”¹

Emerging technologies make it practical now to approach learning in ways that learning scientists have advocated for many years. Unfortunately, the practices recommended by educational psychologists and cognitive scientists are not pervasive in our country’s classrooms and training centers. Individualized instruction, subject-matter experts, and rich curricular activities are often simply too expensive. Expense and related challenges often cause both formal education and corporate training to rely on strategies that ignore the findings of learning research. For the first time in history, technology exists that can make vastly improved learning systems routinely available. Furthermore, networking bandwidth capacity, computational power, and graphics capability will improve dramatically in the next few years. We will have even more powerful, less expensive technologies available to support teaching and learning. But we will not be able to take advantage of these advances unless we undertake a long-term, large-scale effort to develop, test, and disseminate tools for building advanced learning systems. The R&D supported by DO IT will lead to a wide-range of interoperable, well-performing, extensible software tools that can lower the cost of entry for educational materials and systems. This will enable the types of learning I just described to become routinely available to Americans, both inside and outside of the classroom, in both urban and rural communities.

The funding programs supported by DO IT will develop a pipeline of well-educated researchers to contribute to this important field. Some of these researchers will become faculty members and help educate future generations of researchers. Many others will join the workforce to develop next-generation products and services to contribute to U.S. leadership in the education and training sector, in areas such as e-learning services and educational software publishing.

DO IT STRUCTURE AND GOVERNANCE

I feel very confident endorsing the structure and governance model proposed in the Digital Promise’s Report to Congress. It is important that the management structure provide ultimate accountability to the Congress, but also ensure that the management enjoys the stability and independence from political interference needed to guarantee the highest-quality product. The NSF provides a model for meeting this goal and the governance proposed for DO IT is, in general, modeled on this sound and very accountable structure. The NSF Director is appointed to a six-year term and reports to a strong, independent board. Similarly, DO IT would be overseen by a Board of Directors whose members would serve with the advice and consent of the Senate. The DO IT governing board would function much like the National Science Board, the governing board of the NSF. Like the National Science Board, the DO IT Board would be responsible for setting direction and budget guidelines and providing oversight of DO IT. The DO IT Board would be available to Congress whenever needed, just like the National Science Board. The Director of DO IT would be selected by, and serve at the discretion of, the Board of Directors.

CONCLUSION

Mr. Chairman, I am convinced that the fifty-year plus legacy of the National Science Foundation has been the driving force in the overall leadership of the United States in the fields of science and technology. The nature of the world we face today requires that same kind of incubation of ideas and innovation in the areas of education and training if we are to remain a competitive global leader. My experience as a past Chairman of the National Science Board gives me every confidence that an entity such as DO IT can be effectively governed and structured so as to be thoroughly accountable to Congress and to the public trust. At this point I would like to close my formal remarks. I thank the Committee for allowing me to comment on the Digital Opportunity Investment Trust. I look forward to future opportunities for discussion of this highly important national initiative.

Mr. UPTON. Thank you.
Mr. Welbourne.

¹Report to the President on the Use of Technology to Strengthen K-12 Education in the United States, President’s Committee of Advisors, on Science and Technology, Panel on Educational Technology, March 1997

STATEMENT OF JAMES WELBOURNE

Mr. WELBOURNE. Good morning, Mr. Chairman and members of the subcommittee. My name is James Welbourne, and today I represent the American Library Association. I am also the Director of the New Haven Free Public Library in New Haven, Connecticut. And I am very pleased to be here to speak in favor of the Digital Opportunity Investment Trust, or DO IT. I love that acronym.

Today's libraries are dynamic, modern community centers for learning, gathering information and entertainment. At the New Haven Free Public Library, we are proud of the many community-based activities we offer our citizens, from book clubs and author talks to infant and toddler literacy resources to technology access and job training.

Information has become the great equalizer in today's society and libraries play an increasingly critical role in leveling the playing field by providing communities with no-fee access to technology and information resources. DO IT would allow libraries to bring technology and information resources to an even greater population in both urban and rural communities across the country.

A chain is only as strong as its weakest link, and DO IT would be another important link in building a strong chain to close the digital divide and to meet our Nation's opportunities. Coupled with programs such as the E-rate and Library Services and Technology Act, as well as other local, State and national programs, we can provide equitable and affordable access. We need all these links to meet the needs for accessibility for all.

Modeled after Abraham Lincoln's Land Grant Colleges Act, which authorized the sale and use of public lands to support the establishment of public colleges and universities, DO IT would create an education trust fund by using the billions of dollars in revenue from auctions of unused, publicly owned telecommunications spectrum. The trust fund would support research and development of new educational models and prototypes, taking full advantage of the Internet and other new digital telecommunications technologies. It would support a more robust Internet, where people can find tools for job training and retraining, for education training and more.

At the New Haven Public Library, funds from this trust could be used to help establish a technology and development fund, which would support the triennial replacement of library personal computers. Funds could extend technology access centers to remote community-based locations such as public housing centers, youth development organizations and police substations, and funds could go to updating hardware and software accessories in providing critical technology support services to the public and library staff. The trust fund would enhance public participation in civic activities and could be used to invest in new technologies and promote lifelong learning.

The American Library Association is working to ensure that libraries take the lead in providing equitable access to library services and materials for everyone, regardless of age, ethnicity, physical ability, income, language, geographic location or the type of library they are using.

Both rural and urban libraries face barriers to providing equitable services because of both geographical and technological barriers. School, college and university libraries struggle not only with providing basic access to students, but also with the need to provide skill-building and training opportunities for staff. DO IT funds would provide opportunities to enhance staff development and training, break down geographic barriers to access and promote new educational opportunities.

In my system, technology is regularly used to help out-of-work adults search for new sources of employment, provide the tools and expertise needed by job seekers in developing effective resumes or for preparing for occupational testing. We are the first resort for homework assistance by young people using the Internet and CD ROM technology. We provide local businesses with remote access to electronic data bases and commercial information services, and we provide health information and on-line consumer health advice through the electronic health information network.

In each of our neighborhood branch libraries, citizens have not only access to the Internet and e-mail, but are also offered skill training on word processing, spreadsheet applications, World Wide Web searching, Internet and computer basics. These services have proved critical to average citizens trying to keep current with the demands of the technology-driven society.

DO IT can also provide the means for libraries to digitize special collections. Many libraries, like the one at Yale University, have unique collections and materials that should be accessible to the general public, via the Internet. With new capabilities, patrons will be able to view interactive 3-D versions of each item in the special collection without having to travel outside of their own community. A student could visit the Library of Congress from any State in the country and be able to virtually walk through the doors of the library into the Great Hall, to page through the Gutenberg Bible and to graph the maps in the Hammond collection.

I would like to thank Chairman Upton, Mr. Markey, Mr. Towns and other members of the subcommittee for presenting me the opportunity to speak with you today. And I also would like to thank the National Science Foundation for their generous grants to support workshops and research and collaborative opportunities for libraries in advanced networking.

[The prepared statement of James Welbourne follows:]

PREPARED STATEMENT OF JAMES WELBOURNE, DIRECTOR, NEW HAVEN FREE
LIBRARY, CONNECTICUT

Good Morning Mr. Chairman and Members of the subcommittee.

My name is James Welbourne. I represent the American Library Association (ALA) and am the Director of the New Haven Free Public Library in New Haven, Connecticut. I am very pleased to be here to speak in favor of the Digital Opportunity Investment Trust, or "DO IT."

The American Library Association is the oldest and largest library association in the world. Among its 65,000 members are public, academic, and school librarians, library trustees, members of the library business community and friends of libraries. Today, there are more than 124,000 libraries in the United States. In addition to public libraries in almost every community, there are thousands of libraries in schools, colleges and universities, hospitals, law firms, businesses, the armed forces and more. Because libraries offer free access to information for all, they bring opportunity to all.

Today's libraries are dynamic, modern community centers for learning, gathering information, and entertainment. The New Haven Free Public Library is proud of the many community-based activities we offer our citizens—from book groups and author talks to infant and toddler literacy resources, to technology access and job training. Information has become the great equalizer in today's society, and libraries play an increasingly critical role in leveling the playing field by providing communities with no-fee access to technology and information resources. DO IT would allow libraries to bring technology and information resources to an even greater population in both urban and rural communities across the country.

A chain is only as strong as its weakest link and DO IT would be another important link in building a strong chain to close the Digital Divide and to meet our Nation's Digital Opportunities. Coupled with programs such as the E-rate and the Library Services and Technology Act as well as other local, state and national programs, we can provide equitable and affordable access. We need all these links to meet the need for accessibility for all.

Modeled after Abraham Lincoln's Land Grant Colleges Act, which authorized the sale and use of public lands to support the establishment of public colleges and universities, DO IT would create an education trust fund by using the billions of dollars in revenue from auctions of unused, publicly-owned telecommunications spectrum. The trust fund would support research and development of new educational models and prototypes, taking full advantage of the Internet and other new digital telecommunications technologies. It would support a more robust Internet where people can find tools for job training and retraining, for education training, and more.

At the New Haven Public Library, funds from this trust could be used to help establish a Technology Development Fund, which would support the tri-annual replacement of library personal computers. Funds could extend Technology Access Centers (TAC) to remote community-based locations such as public housing centers, youth development organizations, and police sub-stations; and funds could go to updating hardware and software accessories and providing critical technology support services to the public and library staff.

The trust fund would enhance public participation in civic activities and could be used to invest in new technologies and promote lifelong learning.

The American Library Association is working to ensure that libraries take the lead in providing equitable access to library services and materials for everyone regardless of age, ethnicity, physical ability, income, language, geographic location or the type of library they are using. Both rural and urban libraries face barriers to providing equitable services because of both geographical and technological barriers. School, college, and university libraries struggle not only with providing basic access to students, but also with the need to provide skill-building and training opportunities for staff. DO IT funds would provide opportunities to enhance staff development and training, break down geographic barriers to access, and promote new educational opportunities.

As Director of the New Haven Free Public Library, I oversee a library system that serves a resident population of 123,000, and a daily commuting population averaging around 72,000 individuals. In my system, technology is regularly used to help out-of-work adults search for new sources of employment; provide the tools and expertise needed by job seekers in developing effective resumes or preparing for occupational testing. We are the first resort for homework assistance by young people using the Internet and CD-ROM technology; we provide local businesses with remote access to electronic databases and commercial information services, and we provide health information and online consumer health advice through our electronic Health Information Network. In each of our neighborhood branch libraries, citizens not only have access to the Internet and e-mail, but are also offered skills training on Word Processing, Spreadsheet applications, World Wide Web searching, Internet, and Computer Basics. These services have proved critical to average citizens trying to keep current with the demands of a technology driven society.

Imagine a scenario where the hospitals and medical systems in the city use a network to share MRI images over the Internet while also videocasting views from surgery. Or imagine researchers, located at various geographical sites, using the system to hold a videoconference to discuss the latest research on genetically modified organisms where computer generated models are viewed at all sites simultaneously.

At the same time, a student studying a foreign language connects with a class in Europe learning English. "Listening in" at the nearest local library branch is the student's instructor—there to assist in the learning process. Or, a student travels to the local library and logs on to the library's computer to access an online tutor with whom she works in real time, manipulating computer generated images in order to complete the student's report.

These scenarios envision linking institutions together to benefit both the city and its citizens. These are the types of advanced networking opportunities the DO IT fund can provide for cities like New Haven as well as for rural communities where, with new technologies, even the most geographically isolated patrons could be participants in a collaborative virtual environment they would otherwise be unable to afford.

DO IT can also provide the means for libraries to digitize special collections. Many libraries, like the one at Yale University, have unique collections and materials that should be accessible to the general public via the Internet. With new capabilities, patrons will be able to view interactive, 3-D versions of each item in the special collection without having to travel outside of their own community. A student could visit the Library of Congress from any state in the country and be able to virtually walk through the doors of the Library into the Great Hall, to page through the Gutenberg Bible, and to graph the maps in the Hammond Collection.

Many scenarios are possible with investment in research and with the development of new tools, systems, and content based on digital technologies. DO IT will leverage the use of private funds in pursuit of new information technology developments in the public interest. It will stimulate ideas and models designed to enhance the use of technology for teaching and learning. If we are all connected to resources and linked together in a collaborative environment, we can erase digital divide issues, bring down virtual and physical barriers, and unify public and private institutions, businesses, government and citizens.

I would like to thank the Chairman and Members of the subcommittee for presenting me the opportunity to speak with you today. I would also like to thank the National Science Foundation for their generous grants to support workshops and research into collaborative opportunities for libraries in advanced networking.

Mr. UPTON. Thank you.

Ms. Lew.

STATEMENT OF GINGER EHN LEW

Ms. LEW. Mr. Chairman, members of the subcommittee, my name is Ginger Lew. I am the CEO and Managing Partner of the Telecommunications Development Fund.

TDF is a private, nonprofit corporation based in Washington, DC. Congress established us with bipartisan support as part of the Telecommunications Act of 1996 to promote access to capital for small businesses, to strengthen competition in the communications industry, to stimulate new technologies and to enhance delivery of communication services to rural and underserved markets.

We receive our funds—in fact, our funds are nontaxpayer dollars. Actually, we receive our funds from a private financial institution that now pays interest on the spectrum auction upfront deposits, an innovative funding mechanism developed through the innovative mind of Congressman Towns and others who sponsored this legislation.

TDF has two key missions first to provide education and training to entrepreneurs in the communications industry; and second, to make investments in small, early stage communications companies. We cast a wide net to find these opportunities by participating in entrepreneurial outreach activities and programs throughout the United States. We believe that there are smart, bright entrepreneurs with innovative technologies and promising businesses in places in addition to the traditional venues that we hear about all the time—Silicon Valley and the Northeast Corridor which collectively receive 73 percent of all venture capital. We have been to Maine, Illinois, New Mexico, Florida, Georgia, Kansas, Oklahoma and elsewhere in urban and rural communities in search of these companies.

The sad fact is that there continues to be a significant lack of capital for small businesses in nontraditional communities. If you are a first-time entrepreneur, trying to find that first half million dollars, and perhaps even up to \$3 million, that is a Herculean effort especially for the communications sector.

At the height of the Internet bubble, communications investments received about 39 percent of all the venture capital invested. Today, it is less than 6 percent. According to the National Venture Capital Association, during the past four quarters, the venture capital industry invested approximately \$18 billion. Unfortunately, the National Association of Investment Companies, a trade association for minority-led investment funds, estimates that less than one-half of 1 percent of all venture capital are invested in companies led by people of color.

And the Kauffman Foundation estimates that less than 5 percent of all venture capital is invested in companies led by women. This is despite the fact that women own more than 26 percent of all the small businesses in the United States, and minorities own 15 percent of all the small businesses in the United States.

While TDF is race and gender neutral in our investment criteria, we cast a wide net to look for people-of-color- and women-led companies. I am pleased that more than 60 percent of the companies that we have invested in have founding members who are people of color and women.

TDF believes that it provides essential seed capital to a significantly underserved small business segment. For example, in 2001, TDF made a investment in a company based in rural Kansas. The company had developed some very interesting wireless technologies. The company was being looked at by a number of small investors who were very reluctant to make the investment because they lacked industry expertise.

When TDF got involved, we pulled together an investment group. Over the course of the past 2½ years, we have worked closely with this company, served on its board and brought new, experienced management to the company. Today, the company is getting ready to launch its products in a number of industry verticals and has working partnerships with well-known PDA manufacturers.

This is an example of a company that would not have received any investment moneys had TDF not participated. These jobs would not have been created and this technology would not have been launched.

Starting new businesses can be a challenge. Recent studies show that 24 percent fail in their first 2 years; 53 percent fail in the first 4 years. Investing in early stage communication companies face similar challenges. While capital is a component to success, another is entrepreneurial training.

This brings me to TDF's second critical mission, to provide educational training and outreach to entrepreneurs and would-be entrepreneurs. In 2002, our six-person investment staff participated in more than 400 events and more than 22 States that reached a estimated 10,000 entrepreneurs.

Last year, via TDF's Web site, we launched a self-guided course on the basics of corporate governance geared toward entrepreneurs. It explains why corporate governance is important and why an en-

trepreneur should include this in their business. It was the first of its kind and we received praise from such organizations as the National Association of Corporate Directors.

We have worked with organizations, such as the National Science Foundation, to help them develop a matchmaker program to introduce SBIR grantees to outside private investors. The key point here is that we have been able to reach many entrepreneurs with a small staff by leveraging limited resources and forming partnerships with many organizations. These are just a few examples of what TDF has done.

Thank you for the opportunity to testify. I would like to express my appreciation to Chairman Upton, Congressman Markey, especially Congressman Towns and Mr. Wynn for their continued support of TDF and for H.R. 747.

[The prepared statement of Ginger Ehn Lew follows:]

PREPARED STATEMENT OF GINGER EHN LEW, CEO AND MANAGING PARTNER,
TELECOMMUNICATIONS DEVELOPMENT FUND

Mr. Chairman, Committee Members, Ladies and Gentleman, my name is Ginger Lew and I am the CEO and Managing Partner of the Telecommunications Development Fund (TDF), a private, non-profit corporation based in Washington, DC that provides education and training for entrepreneurs in the communications industries, and makes equity investments in small, early stage communications businesses.

I thank you for the opportunity to testify today regarding your important topic, "Digital Dividends and Other Proposals to Leverage Investments in Technology." Because TDF has been intensely involved in promoting the growth of technology in the communications sector since our inception, I would like to tell you about our background and mission, and describe our goals for the future and how they may be affected positively by currently proposed legislation, H.R. 747.

The Telecommunications Development Fund (TDF) was established by Congress with bi-partisan support as part of the Telecommunications Act of 1996. It was the brainchild of Congressman Edolphus Towns of New York. Congressman Towns conceived TDF as a means of expanding the reach of our telecommunications system for the benefit of all Americans, and as a way to assist new entrepreneurs who have the talent to develop brilliant technology but are hampered by a lack of access to capital and the management tools they need to succeed.

As defined by Congress, TDF's mission is to act as a catalyst for the creation and enhancement of a first-class communications system for all Americans, by

- Promoting access to capital for small businesses;
- Strengthening competition in the telecommunications industry;
- Stimulating new technological growth and development;
- Promoting universal service; and
- Enhancing the delivery of telecommunications services to rural and underserved areas.

In accordance with its statute, TDF has a seven member Board of Directors appointed by the Chairman of the Federal Communications Commission (FCC). The statute specifies that the Board consists of seven members, four from the private sector and three from the public sector, with one representative each from the FCC, the Small Business Administration (SBA) and the Department of the Treasury (Treasury). Members of the Board serve for a term of five (5) years.

The Board of Directors was empowered by statute to determine the best ways to carry out TDF's mission. In furtherance of the mission, the Board formed TDF, Inc., a 501(c)(4) corporation that would provide education and outreach to emerging entrepreneurs. To fulfill the funding side of its mission, the Board thoroughly reviewed a number of options and concluded that making equity investments in early stage communications companies would be the best course to follow. Therefore, the Board created an investment entity, TDFund, LP, an early stage venture capital firm, wholly owned by TDF, Inc., that makes equity investments in small telecommunications businesses and provides them with ongoing management guidance. TDFund, LP is an "evergreen" fund, which means the return on its investments comes back to TDF, Inc. and to be reinvested in new companies.

Our Board provides guidance to TDF in matters of corporate governance, financial and investment policies and general industry expertise. The Board members provide

guidance about overall investment policies of TDF. However, in order to ensure that no actual or perceived conflicts of interest or compromise of regulatory independence occur, the representatives of the FCC, Treasury, and SBA do not receive any investment-specific information. TDF continues to be very fortunate to have dedicated Board members who give freely of their industry and corporate expertise. All TDF Board members serve without compensation, and have declined any reimbursement for out-of-pocket expenses.

The members of the Board and the dates on which their terms expire are listed below.

PRIVATE-SECTOR MEMBERS

W. Don Cornwell, *Chairman*, Chairman and Chief Executive Officer, Granite Broadcasting Corporation, New York, NY.

Thomas A. Hart, Jr., *Vice-Chairman*, Partner, Shook, Hardy & Bacon, Washington, DC.

Richard L. Fields, Managing Director, Allen & Company, Incorporated, New York, NY.

Debra L. Lee, President and Chief Operating Officer, BET Holdings, Inc., Washington, DC.

PUBLIC-SECTOR MEMBERS

Michael Powell, Chairman, Federal Communications Commission, Washington, DC.

Melanie Sabelhaus, Deputy Administrator, U.S. Small Business Administration, Washington, DC.

U.S. Department of the Treasury, Washington, DC, vacant.

Congress created a unique funding mechanism for TDF. Section 309(j)(8) of 47 U.S.C. was amended to state:

(C) Deposit and Use of Auction Escrow Accounts—Any deposits the Commission may require for the qualification of any person to bid in a system of competitive bidding shall be deposited into an interest bearing account at a financial institution . . .”

Despite the statutory language and the intent of the authors of the legislation, the FCC chose to interpret the phrase “deposit” to apply only to the “up front” money portion of the deposit moneys.

The upfront payments are those initial bids that private companies submit, along with their spectrum auction applications. The funds are placed in an interest-bearing account in a private banking institution and the interest is passed on to TDF after the winners are named. Previously, this “up front” money was placed with the U.S. Treasury Department and earned no interest.

This is how the bid process works:

The FCC announces a Spectrum License Auction. Companies that wish to bid submit an application that states the amount they intend to bid. Included with the application is 5% of the amount of money they intend to bid as an “up-front” payment. These up front payments are placed in an interest-bearing custodial account in a private financial institution.

Within 45 days of the closing of the auction, the up-front payments of unsuccessful bidders are returned to them. The up-front deposits of successful bidders are transferred to the US Treasury and no further interest is earned. All the interest accrued on the up-front payments held during the auction process is transferred by the private financial institution to TDF.

Successful bidders are required to make an additional down payment on their winning bid for a spectrum license to the US Treasury, for a total of 20% of the successful price. At this stage the initial up front deposit and the additional down payment are held by the US Treasury in a non-interest bearing account.

TDF does not receive any interest from money held at this stage. There is no interest on these deposits.

Pursuant to negotiations, successful bidders are required to pay the full price of the spectrum pursuant to the terms of an agreement reached with the FCC.

Once agreement is reached on payment terms, licenses may be issued.

Since 1996, TDF has received a total of \$49.9 million in contributions from the interest earned on the upfront payments for spectrum license auctions.

Contributions breakdown:

1996	6,515,700.00
1997	14,457,285.00
1998	3,314,995.11
1999	2,557,584.47

2000	3,052,324.34
2001	19,710,639.27
2002	267,647.77
2003	9,249.06
TOTAL:	49,885,425.06

TDF officially began its operations in 1998 by undertaking certain organizational and start-up activities such as leasing office space and hiring staff. When these basics were completed, we embarked on working to fulfill our mission through entrepreneurial outreach and education, investments and portfolio management. Our first investment closed on December 31, 1999, and TDF is therefore characterized as a vintage 2000 fund.

INVESTMENTS AND PORTFOLIO MANAGEMENT

TDF's investment activities are guided by the statutory mission of the Fund, by the size of the Fund and by established investment industry management principles. Consistent with its mission to promote competition in the communications industry and catalyze the development of new communications products and services for consumers and businesses of all sizes, the Fund strictly limits its investment activities to the communications sector. Within this sector, however, the Fund seeks to operate broadly, entertaining investment opportunities related to the transmission of voice, data and/or video in wireline, wireless or "casting" environments through software, hardware or services mediums.

Also consistent with its mission, TDF casts a wide net in search of high quality entrepreneurs and businesses. As a result, the Fund seeks investment opportunities from a highly diverse group of entrepreneurs with widely varying degrees of past entrepreneurial experiences, including first time entrepreneurs.

These emerging business leaders operate enterprises headquartered in urban, suburban, ex-urban and rural areas. In addition to providing capital, TDF commits valuable advisory services that assist new entrepreneurs in building the corporate infrastructure necessary to operate successfully.

Because of the early-stage characteristics of investment opportunities in this sector, the Fund invests its capital in exchange for equity in the portfolio company. Before such an investment is made, each opportunity is subjected to extensive and rigorous review. Initially, the Fund establishes that the opportunity matches TDF's overall investment criteria and that an investment in the company is consistent with TDF's mission. Before funding is forthcoming, TDF pursues in-depth due diligence review on many decision factors. These factors include, but are by no means limited to, the background of the management team, the strength of the company's core technology, the end user value proposition, the size and segmentation of the market, the relative strength of current and potential competitors, and characteristics of the distribution channel. Overall, the Fund seeks to create a portfolio of communications investments consistent with prudent investment principles. As a result, the amount of capital committed to any single portfolio company is generally limited to 10% of the funds under management. Given the current size of the Fund this translates to a maximum of \$5 million. The Fund typically invests this capital in stages as the portfolio company progresses in its development.

The Investment Team, which consists of the CEO, Chief Investment Officer, a Vice-President, two Associates and a Market Analyst, conducts the due diligence and business plan review. TDF's investment criteria and the review process are described through the Website homepage, creating transparency and offering guidance.

TDF has continued to be very active in its deal-sourcing efforts through the economic downturn of the past few years, which saw a steep decline in overall private equity investing, and especially in early stage investing.

To date, TDF has invested approximately \$12 million in 12 start-up communications companies and \$25 million is available for investment.

Telecommunications Development Fund Geographic Diversity of Portfolio

Northeast	2
Mid-Atlantic	4
Southwest	1
Midwest	3
Southeast	0
Pacific	2

Telecommunications Development Fund Portfolio Distribution by Communications Sector

Wireless	4
Wireline	3
Internet	2

ENTREPRENEUR ASSISTANCE AND OUTREACH

Virtual Educational Courses

Consistent with its mission, TDF provides technical and management assistance to entrepreneurs. In an effort to reach a wider range and larger numbers of entrepreneurs, TDF has designed online, virtual courses accessible 24 hours a day, seven days a week via the Internet. The online educational courses continue to be a highly accessed section of the TDF Homepage.

Basic Venture Capital Process

After conducting a review of available training materials and coursework on equity financing and finding very few quality resources, TDF created a virtual Equity Financing Course that may be taken by an entrepreneur at any time, anywhere. In order to maximize its outreach, TDF partnered with the Small Business Administration (SBA) as a co-host through SBA's online or virtual classrooms because the SBA classroom model already was tested and established. TDF provided the expertise on a new subject, equity financing, to complement the materials already available on other means of financing small businesses.

The *Equity Financing Course*, available since late 2000 on the TDF homepage (www.tdfund.com) and the SBA web site (www.sba.gov), presents basic information on equity financing, the types of investors (angels and venture capitalists), and suggestions for working with investors. The course includes a description of the elements of a business plan written for investors and an example of a plan and executive summary. An extensive glossary of venture capital terminology is included as well as numerous links to other useful information sites and resources. Throughout the course are brief audio introductions to each section reflecting the diversity of successful entrepreneurs and investors working with TDF.

This is a self-paced, easily accessible virtual classroom that provides extensive information on equity funding consolidated in one location that may be accessed from any location and at any time of the day or night. The course is available in both English and Spanish, and TDF remains open to inquiries for translations into other languages. TDF continues to receive positive feedback from entrepreneurs and resource providers about the *Equity Financing Course*.

Corporate Governance

In 2002, TDF completed development of additional educational content for entrepreneurs that focused on basic facts and practices relating to corporate governance for young companies. This important text, *Building Your Board: A Corporate Governance Guide for Entrepreneurs*, was previously unavailable in any format. This significant course content was posted on the TDF website and has been available at no charge since the fall of 2002.

TDF collaborated with the National Association of Corporate Directors, knowledgeable legal experts, experienced corporate directors and successful entrepreneurs for the development and review of the content. *Building Your Board* has also received endorsements and online hyper links to the course from many venture capital and corporate governance focused associations. Wide distribution and endorsements demonstrate the value of such information and the need for this ground-breaking material.

As a result of the interest raised with the national press coverage of the posting of the course, TDF staff has spoken at many meetings, forums, and seminars on the basics of developing sound corporate governance within early stage companies. Additionally, the content has been incorporated into appropriate materials for additional "training the trainers" courses and seminars.

Website

The TDF Website is continually revised and refreshed as a dynamic information source for the general public. A Library Section containing helpful articles has been added, and the online, searchable database, which includes links to business advisors throughout the United States, has been expanded and refined to help entrepreneurs find useful professional resources in their geographic location. The database contains approximately 5,000 entries and is continually updated and expanded. By migrating to a web-enabled database, TDF utilizes the latest technology allowing instantaneous changes to be incorporated into the system. Keeping in mind that some entrepreneurs may be accessing the Internet at public facilities such as schools and libraries, TDF's Website was designed to be accessible via most computer and dial-up systems.

Outreach

Our activities last year present an accurate example of outreach efforts. In 2002 alone, TDF participated in more than 400 events in more than 22 states that reached an estimated 10,000 entrepreneurs and would-be entrepreneurs from traditional and non-traditional communities. TDF reached entrepreneurs through a number of different forums.

TDF was the first investment fund recruited as a continuing sponsor for the third year of Springboard Enterprises venture capital forums because TDF recognizes the growing economic impact of women-led businesses. Springboard Enterprises leads a series of venture capital forums that has showcased over 250 women-led companies to date including three sites during 2002; the Southwest Forum was held in Dallas in mid-March hosted at the Fidelity Investments Campus, the Southeast Forum on the campus of the University of North Carolina at Chapel Hill held in September, and the New England forum held in November at the Massachusetts Institute of Technology. Organized as regional events, each of the forums recruited women-led businesses from rural areas as well as urban environments to present their companies to hundreds of private and corporate investors in a daylong event.

After ten venture forums to date, over 3,000 companies submitted applications, more than 250 women entrepreneurs presented to more than 2,000 investors, and involved many more investors, financiers and business development professionals in screening, selection and coaching. The presenting companies have secured over \$1 billion in equity financing, one company has had a successful Initial Public Offering (IPO), and many of the companies have completed mergers or acquisitions. Over 40% of the presenting companies received funding during a declining market period and over 80% of the presenting companies remain viable, operating companies.

Recognizing the importance of developing a pipeline of companies preparing for high growth and the need for equity capital, TDF has worked closely with Springboard Enterprises to launch additional "products" for developing entrepreneurs and their companies, particularly in second and third tier markets. The VC Tune-Up programs were launched in Kansas City, Missouri to assist very early-stage entrepreneurs. For slightly more mature companies, Springboard Boot Camps were designed to provide intensive interaction with investors and learning through interactive case studies. TDF actively sponsored and participated in Boot Camps held in Washington, DC (at George Washington University), New York City (at Goldman Sachs Headquarters) and Los Angeles, California (at the Milken Institute).

Since recognizing the success of the Springboard model, TDF has worked closely with the Emerging Venture Network and the Emerging Business Forum as well as the National Science Foundation to incorporate lessons learned and best practices helpful for minority led companies and those commercializing technologies funded under the federal Small Business Innovative Research (SBIR) programs.

In fulfilling the mission of TDF, we seek ways to assist new and emerging telecommunications businesses access to technical and management assistance. To that end, TDF has identified key resource providers throughout the United States, established a dialogue and working relationships to raise awareness of the needs of the business owners, examined key factors in obtaining capital infusion for entrepreneurs, and made that information readily available to entrepreneurs across the U. S. TDF staff continued to expand the training course presentations targeting groups of resource providers who can, in turn, expand and enhance information provided to entrepreneurs investigating equity financing in local business centers. The TDF "training of the trainers" seminars resumed in 2002 and have been recognized as a strong training and resource component by business advisors throughout the United States.

TDF continues to build beneficial relationships with the expanding network of business specialists assisting small business owners. Informal public-private partnering relationships have been identified and fostered. Small Business Development Centers (SBDCs) and the Angel Capital Electronic Network (ACE-Net) Operators, originally under the auspices of the Office of the Chief Advocate at SBA, provide the backbone of the network in all fifty states and U. S. territories. Additional federal resources such as Small Business Investment Companies (SBICs), the Minority Business Development Agency (MBDA), National Telecommunications and Information Agency (NTIA), college and university entrepreneurial centers as well as resources on the state and local level are working with business and investment specialists from the private sector to assist and train entrepreneurs.

Although many entities in the business resource network have been affected by the downturn in the economy, TDF continued to work with remaining business incubators and accelerators, professional and trade associations, women's business centers, online assistance sites and professional services providers in order to expand our outreach across the United States. TDF has also fostered working relationships

with colleges and universities as they expand their interest and course offerings in entrepreneurship. As with federal research laboratories and the SBIR grantees program, the university relationships have extended into preliminary work on technology transfer and commercialization of research technologies.

Either via telephone or through the TDF Inquiries electronic mail system, general requests for information or a review of a company's financial needs average about 250 per month. TDF receives many business plans that do not meet the Fund's published investment criteria and, therefore, the entrepreneurs are sent letters declining the opportunity to provide investment financing to a particular company. As much as possible, TDF provides feedback to those applicants, often detailing TDF's specific suggestions for improving the company's presentation or other key components needed to interest an investor. When appropriate, a localized, targeted list of assistance sites is provided so that those entrepreneurs receive an outline of suggested next steps for that business in finding capital.

In building a network of resources, TDF reaches outside the organization to develop collegial and productive relationships within the venture investment community. Accordingly, TDF representatives work with a number of organizations such as the National Venture Capital Association, the Baltimore-Washington Venture Group, The Private Investors Network, George Mason University's Grubstake Breakfast Series, the Mid-Atlantic Venture Association, the Illinois Venture Capital Association, the National Association of Investment Companies, the National Association of Small Business Investment Companies, the National Association of Seed and Venture Funds, WomenAngels.Net, and other angel and industry groups. These forums enable TDF to meet other private investors with whom it could co-invest and leverage its funds while expanding resources for entrepreneurs. TDF staff members have taken an active leadership role particularly in coaching and mentoring those entrepreneurs presenting their companies to investors in a variety of "forum" settings.

TDF reaches underserved audiences of entrepreneurs through organizations such as Springboard Enterprises, the Forum for Women Entrepreneurs, the Center for Women Entrepreneurs, the Capital Telecom Professionals, the Minority Media & Telecommunications Council. TDF has identified resources such as the Ewing F. Kauffman Foundation, the Ford Foundation, the National Commission on Entrepreneurship, the Northern Virginia Technology Council, Capital Venue as well as many entrepreneurial centers operating close to major colleges and universities. These relationships enable TDF to leverage its advisory services by forming a network of resource and technical advisors. TDF staff members have participated as moderators and panel participants often throughout the year sharing views on the telecommunications industry outlook, the venture capital climate, corporate governance for early stage companies, and advising entrepreneurs on a wide range of topics.

TDF works closely with significant private sector resource providers and industry analysts to expand the resource network available to entrepreneurs competing in new telecommunications businesses. Talented and prestigious legal, accounting and consulting firms have established small business practices, often working at reduced rates for new businesses, to ensure well structured and sound establishment of young businesses. TDF has worked with established telecommunications and small business practices in the leading consulting organizations such as Legg Mason, KPMG, Deloitte & Touche, Grant Thornton, McKinsey & Company, PriceWaterhouseCoopers and now International Business Machines (IBM).

Additionally, TDF worked with many non-profit groups that mentor or nurture new businesses such as the MIT Enterprise Forum, the Center for Innovative Technology, the National Congress for Community Economic Development, and the National Association of Seed and Venture Funds. Technology resource relationships have been developed through the extensive federal research lab commercialization offices and the Small Business Innovation Research (SBIR) program. TDF has worked closely with the National Science Foundation (NSF) on the SBIR/STTR advisory board. Through that relationship, TDF and NSF developed the Match Maker project to introduce grantees to outside investors that launched in early 2002.

CONTINUING TO FULFILL TDF'S MISSION

TDF's role in contributing to the creation of a first class communications system for all Americans was given added urgency with the events of September 11, 2001. Communications technology is especially needed for the military and for homeland security and these technologies are often developed by the kind of emerging communications companies in which TDF invests. Also, there are still many underserved areas that desire broadband services and other new communications technologies that are needed to enhance their safety.

Additionally, by increasing investments in early-stage communications industries, TDF will play an important role in creating the next level of technology that will stimulate our country's economic growth.

Congressman Edolphus Towns, the originator of the legislation that created TDF, has said that it was his intention that not only the "up-front" money paid by bidders in spectrum auctions but also the "down payment money" would be put in interest-bearing accounts, with TDF receiving the interest payments at the conclusion of the auctions. However, because of a regulatory misunderstanding, the funding mechanism was set up so that only "up-front" payments were deposited in interest-bearing accounts. Because of this error, it is estimated that TDF was denied approximately \$100 million.

To correct this inequity, Congressman Towns, along with Chairman Upton and Congresswoman Heather Wilson, have introduced H. R. 747. This legislation would mandate that down payments made by winning bidders in spectrum auctions held after H.R. 747 is enacted would be deposited in interest-bearing accounts. This interest earned on these accounts would be passed on to TDF at the conclusion of the auctions.

We at TDF thank you, Chairman Upton, as well as Congressman Towns and Congresswoman Wilson, for the confidence you have demonstrated in our ability to continue to fulfill our important mission. We urge your colleagues to join you in supporting H.R. 747.

Mr. UPTON. Thank you very much.

We will move to questions and we will rotate with 5 minutes. Again, all opening statements will be part of the record for those members who choose to make one.

Mr. Minow, I think you hit it on the head at the beginning when you talked about the deficit; and those of us who are fiscal hawks are more than alarmed at the way things have gone the last couple of years and different things that are tugging every which way.

I just wonder if you know, as proposed, whether the DO IT bill is funded by the receipt of 30 percent of the revenues from the spectrum auctions as well as the license fees authorized. Have you done a back-of-the-envelope projection in terms of the amount that would be collected.

Mr. MINOW. Mr. Chairman, we have. But subject to the fact that we don't know how many auctions there will be——

Mr. UPTON. I know just two in the upcoming—the 700 megahertz auction, and that is hoping maybe \$5 billion; and 3G auction, triple that.

Mr. MINOW. We have used the \$20 billion number based on a back-of-the-envelope estimate over a period of years for future auctions. I don't think there is any question that the demand, particularly of the cell phone people for spectrum space is intense.

I don't think the prices that were paid in the late 1980's, early 1990's are going to be as much in the future as they were then. There were a lot of bubbles in that. But I think it is fair to say that a \$20 billion number over a period of time and what we are suggesting—and obviously Congress will have to give this a lot of study and debate, we are suggesting that the interest only, the interest only on that go to DO IT, not the full amount; the 20 would remain in taxpayer Federal funds.

Mr. UPTON. Are there any other programs that would be offset, taken away, whether it be earmarks or other line item budget amounts, that we might be able to offset the new program that you have identified.

Mr. MINOW. When we started on this, Mr. Chairman, I went to see the CHAIRMAN of the Senate Appropriations Committee, Ted Stevens, whom I happen to have known long before he went into

politics; we had a case together in Alaska. And he said, Newt, you don't have to persuade me. I went to college on the GI bill and I went to a land grant college. He said, Where is the money coming from? I am the chairman of the Senate Appropriations Committee.

So we explained it to him, about the interest only, and I grant you that was before 9/11, but I do believe that there is enough room there if we are only talking about the interest to fund it.

And I come back to what I said earlier. The precedents were during wartime. Congress decided in the midst of the Civil War, right after the Revolutionary War, and World War II you had to make an investment in the education.

Mr. UPTON. Mr. Welbourne, Mr. Kelly and Ms. Lew, any thoughts in that regard.

Ms. LEW. Mr. Chairman, I can only comment that TDF receives interest paid by financial institutions that holds the upfront deposit moneys in an escrow account during the period that the auction is held. So it is a very short window, and it is a very—has been extremely difficult to make an estimate as to how much money would be generated through this process when the TDF legislation was first considered. The estimates were as high as \$350 million that we could get from this process.

In reality, it has taken us almost 6 years to gather \$50 million. So it really is a difficult process to estimate the impact in this legislation.

Mr. UPTON. Mr. Kelly?

Mr. KELLY. Let me comment. When I took over as President of Tulane University in 1980, we purchased the first university computers. They were the size of the entire area here.

That cost \$8 million. I now have a personal computer that is about half the size of this, weighs 3 pounds. It cost \$1,500 and it has 10 times the power of that roomful of computers. Moore's law will continue, and the cost of computing is going to continue to decline. You add on to that nanotechnology, the technology of the molecular or the atomic, we are operating at that size. In the very near future, within 3 years we are going to have the equivalent of infinite bandwidth and infinite processing power. The costs are going to continue to decline. Everything will be moving into some form of wireless or other. That means that the telecommunications is going to become as ubiquitous as the handheld telephone. It is going to dramatically change all of education, and that educational change is going to determine the economic activity of this country as well as the economic opportunities for all of our citizens.

This is a critical investment at a critical point in time that will have a leveraging effect that is simply enormous, in my judgment, will outdistance them all, will outdistance the G.I. Bill and its impact. The entire learning is going to change dramatically. This is a critical investment. I know you have difficult priority questions, but this may be the single most important investment that this country can change at this time.

Mr. UPTON. Mr. Markey.

Mr. MARKEY. Thank you, Mr. Chairman, very much.

I think that the issue isn't whether we can afford it. The question is, really, can we afford not to do it? You know, there are reports that the United States could lose 3 to 7 million jobs over the

next 5 to 10 years to countries like India and others that are also focusing upon this whole area of software and information, and more and more American companies are actually using those countries as places where they will do their work. So we have a real challenge ahead for ourselves. And as you said, Mr. Minow, not only did the G.I. Bill only pass by one vote, but President James Buchanan actually vetoed the Land Grant Act the first time it came out of Congress to the President's desk, and then Lincoln had the vision subsequently to sign it.

So my question to you is, in this age of terrorism and global competition increasingly, and as symbolized by the role that India is now playing and draining jobs out of our country at the high end, the information end, could you elaborate on the role that this fund could play in this era of terrorism and global information competition.

Mr. MINOW. Let me give you one specific example. Congressman Regula heard our story. He persuaded the Congress to award 750,000 to enable us to do the report, which we have filed with every Member of Congress. We had a little money left over, and we are using that, with his okay, to fund a course for first responders to acts of terrorism. We are creating a course which will be first used in New York City, but then made available throughout the country to firemen, policemen, hospital people, ambulance, to train them through modern technology in the needs of what a first responder has to do.

We think this technology is so powerful that this is a perfect example at this time of terror in the country to use it, and we think that same technology can be used over and over again in all parts of the country for all lifetime learners. Not just kids, but all lifetime learners. But that is a very good example of what we are about.

Mr. MARKEY. I would just correct you on one thing: It is not that Mr. Regula convinces Congress to do things; Congress tries to convince Mr. Regula to do things.

Let me go to you, Mr. Kelly. What is the role of universities in this era? So you are saying that this could be even more important than the land grant? So what is the role of innovation, development of new ideas that you believe the university community can provide if we put together this kind of trust fund.

Mr. KELLY. Well, first let me comment on your previous question briefly. I serve as a consultant to the Southern Defense Command. In terms of disaster prevention throughout Latin America, the Southern Defense Commander did an absolutely great job on that. Their entire approach, both their training approach and their research approach, was virtual. And so the information technology had that kind of an impact in that program; it would have the same or will have a similar impact and be the key, in my judgment, in terms of our anti-terror programs.

So the universities, the universities have their responsibility both to participate in the training and the research of people that are going to be working in this area. And, more specifically, they have, I think, a responsibility of using their faculties and using their resources to work with the local public school systems and with the

libraries in terms of seeing that this information technology is used to its highest and best potential.

Mr. MARKEY. Mr. Welbourne, Mr. Shimkus made reference earlier to a piece of legislation which he and I passed last year, which is DotKids.us, which creates this kind of green zone, safe zone for kids on the Web, 12 and under. And the Smithsonian has been willing to provide its digitized content for this Web site. There are countless other libraries and museums across the country that just don't have the resources to digitize their assets that then can be made available to this DotKids site. So what role do you think this trust fund could play in kind of closing that divide?

Mr. WELBOURNE. It is a very important contribution that this fund could make in that regard. Libraries are known for the collection sometimes at the local level, the very unique collections that they have acquired or developed themselves, but they are unable to share these broadly or cost effectively. Something that is designed at the national level to encourage libraries along with university libraries to pool this kind of a resource together would be responded to very effectively, both by boards of public libraries as well as directors. And I think that this is a very unique but valuable potential in this area of collection digitizing. And I applaud the DotKids effort as a great model.

Mr. MARKEY. Thank you.

Mr. UPTON. Mr. Walden.

Mr. WALDEN. Mr. Chairman, I have no questions at this time.

Mr. UPTON. Mr. Towns.

Mr. TOWNS. Thank you very much, Mr. Chairman.

Let me begin with Ms. Lew. Everyone knows that the telecom sector lost billions after the downturn in the economy. How are some of the companies that TDF has invested in during this period, recognizing that it has been a difficult period, how have the companies done.

Ms. LEW. Congressman Towns, as you just mentioned, the telecommunications industry has undergone a seismic shift in its financial well-being over the last 2½ years. For example, the Baby Bells cut their capital expenditure budgets in half from \$78 billion to 2003, \$36 billion. Many young startup companies, communications companies were planning to sell to these Baby Bells and other large enterprises have found that their sales cycles have gone from 6-month to 12-month and as long as 18-month.

So these startup companies are having a difficult time. On the other hand, they have been nimble in terms of repositioning themselves. They have been smart in trying to find new customers and new opportunities. And I think the other key factor that has occurred at the same time with the downturn in the telecommunications arena has been the significant withdrawal of investment monies from the capital markets. Again, at the height of the bubble, over \$100 billion was invested in the year 2000. As I mentioned earlier, this year it has been about \$18 billion, a huge, huge decline.

So young companies are looking for new funds, are in search of ever more scarce resources. Had TDF had more money available rather than its current \$50 million, we could be investing, providing just essential capital to many of these companies who need

a longer runway to make it to break even on profitability. So it has been a challenging time for many of these companies.

Mr. TOWNS. Thank you. Let me ask—is it Mr. Minow.

Mr. MINOW. Right.

Mr. TOWNS. At the present time, it is my understanding, that there is no set time on an auction. In other words, it could be a year, 2 years, whatever. Do you think that a set time would help us to be able to determine in terms of how much money would actually be raised? I think when the question comes up as to how much money would this generate, everybody sort of says, well, you know, maybe this, maybe that. But I think that if we had a time set, we would be able to sort of predict how much money we would be able to generate. How do you feel about setting a time?

Mr. MINOW. Congressman Towns, my understanding is the FCC has set two auctions with dates. And as to the future, a lot will depend on something the FCC does not have control over. That is, the Department of Defense issue of whether its current use of the spectrum is going to be changed. I think that it is almost impossible at this point to tell you that there could be specific dates until that issue is resolved.

Mr. TOWNS. I think what I am saying is that, should we legislate it? That is what I am asking.

Mr. MINOW. I am not sure that I know enough about that to give you an intelligent answer.

Mr. TOWNS. Anyone else want to take a crack at it? Because we are trying to figure out, you know, how do we determine how much money, you know, that the potential here? And, of course, if auction goes real fast, I mean, let us face it, less money. So that is the reason why I raise this issue. And that may be something that we need to do on this side to help us to be able to determine. Anybody else? No? Thank you for your help.

I yield back, Mr. Chairman.

Mr. UPTON. Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman. And I want to apologize to the panel for coming in and going out. I do have my crack staffer behind me who has helped me sort through this; but I do appreciate the testimony, and I do have a couple questions. And I want to welcome Dr. Minow. I am an Illinoisan. I am a downstater, though. But here.

Mr. MINOW. I live in Springfield.

Mr. SHIMKUS. Good. That is not downstate enough for me. But it is part of my district, so it is great to have you here.

Let me start like this. I am a market-oriented, as my friend knows, conservative, competition-oriented Republican. So, in that world view, let me ask this: Do you see these investment plans and partnerships raising concerns of anti-competitiveness in the business community by investing in areas of technology or intellectual property that will then be made available free to the public? Will you not run the risk of putting other companies who work in the same areas out of business, therefore possibly running the risk of stifling further development? And how would you minimize the chances of issues like this?

Mr. MINOW. The list of companies that support our proposal is very impressive, mostly high-tech companies who would regard this

as totally consistent with their best interest as well as the public interest. So I think it is very clear that the business community welcomes this, largely because they know that the more education there is, the better they are going to succeed in the market place.

Mr. SHIMKUS. Well, and we have success legislatively when we work together as, again, we know on this committee. And I would encourage you that, if that is the case, that you mobilize those individuals in that sector to help promote the benefits of that. And that will be helpful to many of us here.

Mr. MINOW. That is good advice. Thank you.

Mr. SHIMKUS. Dr. Kelly, you wanted to add something? I saw some gyrations there.

Mr. KELLY. The National Science Foundation—the Internet was originally started by DARPA, taken over by NSF, and in fact, before it was privatized, the Internet was the NSF net. But that has led to tremendous economic boom. The MRI is now a major private sector industry that came out of the scientific research.

So in the same way that the National Science Foundation has really stimulated competition, stimulated economic activity, I think DO IT will have the same impact in terms of all kinds of electronic materials, in terms of systems, and in terms of increased competition.

Mr. SHIMKUS. Well, let us talk about DO IT for a second since you brought it up, and I wanted to follow up on that, too. Can you provide insights in to how the NSF chose the programs or institutions it provides funds to.

Mr. KELLY. Well, the NSF has set up a very firm established merit review system. So essentially what it has done is set out requests for proposals and then evaluated those proposals on a merit review system. And I would anticipate that DO IT would operate in a similar fashion.

Mr. SHIMKUS. Fairly transparent.

Mr. KELLY. Totally.

Mr. SHIMKUS. That is something that, again, Congressman Markey and I have addressed on some other types of issues on the transparency issues, of the winners and losers, and the losers have to understand why they lost they lost.

Mr. KELLY. Absolutely.

Mr. SHIMKUS. And if there is not transparency, at least mischievous undertakings—

Mr. KELLY. NSF responds to every proposal, and indicates the reason for success and the reason for lack of success in the competition.

Mr. SHIMKUS. And let me move to Ms. Lew.

What kind of incentives are in place at TDF to insure wise investment decisions.

Ms. LEW. TDF has in place a due diligence procedure that looks at every business plan that we receive, and we make an assessment based on the quality of the investment management team, the quality—the size of the market, the quality of the technology, and the opportunity for seeking returns on our investment. Because TDF is set up to be what is referred to as an evergreen fund. That is, the proceeds from our successful investments come back to TDF so we can make new investments. So we are not oriented to-

ward making, how would you say, socially driven investments. Our goal is to make investments that yield return, and hopefully additional money so you can make new investments.

I might want to add that the due diligence process at TDF with respect to any new investment takes anywhere from 4 to 6 months in terms of doing a thorough background check investigation and review.

Mr. SHIMKUS. And since I told the Chairman I couldn't be bribed for additional minutes, I hesitate to ask. But if I could follow up with my colleagues for one more question? Thank you.

And I want to follow up with Ms. Lew. Can you tell us a little bit about the companies you have funded, what areas of telecommunications and technologies they specialize in and why you chose them.

Ms. LEW. We have invested in three broad sectors, what we refer to as wire line software and hardware technologies and services, wireless hardware, software, and services. And what we refer to as casting, that is, anywhere from broadcast opportunities to distribution of content through the Internet. We have looked at opportunities to, No. 1, manage the unauthorized sharing of content—in other words, the peer-to-peer sharing, try and prevent the Napster issue. We have invested in technologies that would enable workers to remotely access enterprises through a secure virtual private network.

We invested in another technology, which is a location-based instant messaging secure service that is now being looked at by some Federal agencies. Why we chose these technologies and companies was because we thought they were great market opportunities led by very promising strong management teams.

Mr. SHIMKUS. Thank you. Thank my colleagues, and thank you.

Mr. WALDEN [presiding]. Indeed. The Chair now recognize Mr. Markey for another question.

Mr. MARKEY. Well, I guess my—you are not going to ask questions? Okay. I guess what I would ask is, could each one of you give us a 1-minute summary of what you want the committee to remember out of your testimony, just so we have got your highlight of what, as we begin during this break to talk about what we will do on this issue, you know, what you want us to remember. Could we start with you, Ms. Lew.

Ms. LEW. Thank you, Congressman Markey. I would ask that the subcommittee give serious consideration hopefully support to H.R. 747 that has been introduced by Congressman Upton, Congresswoman Wilson, and Congressman Towns. The goal of H.R. 747 is to make a technical correction to TDF's original legislation. More importantly, it will delete the reference to the Federal Credit Reform Act, which we think was inadvertently placed in TDF's legislation. The Credit Reform Act applies only to government agencies, and requires government agencies to seek an appropriation before they make loans, before they can extend the full faith and credit in a loan process.

Well, TDF is a private corporation. We would like to make loans to small businesses, but we can't because the Federal Credit Reform Act currently applies to us. And we certainly don't want to seek an appropriation. We would want to make loans from our own

proceeds. So I hope that we can seek your support in this effort. Thank you.

Mr. MARKEY. Thank you. Mr. Welbourne.

Mr. WELBOURNE. Yes. I think as libraries, particularly public school and academic libraries, are situated in the country, I would like us to realize that access to this technology in the most cost-effective manner, as represented by those institutions, how they are placed today. We think that with the education of the public generally with technology, we will, in fact, create an economic base in this country for a higher investment advancement of technology simply because the marketplace will increase with the ability to understand and respond to the private sector.

I do want the committee to realize that the private sector really ups its competitive advantage once the whole has achieved a certain level of understanding, and that we can only advance further as we begin to look at using these educational resources to do just that kind of dissemination broadly.

Mr. MARKEY. Thank you.

Mr. Kelly.

Mr. KELLY. Education is really the creation, the development, the transmission of knowledge. Information technology is the creation, development, and transmission of information. They are inextricably intertwined. And in an information society, our education is going to be totally dependent on the technologies that transmit it. And so by making an investment in DO IT, the leverage in terms of its educational impact and therefore its economic impact will be simply enormous.

Mr. MARKEY. Thank you.

Mr. Minow.

Mr. MINOW. I would ask Congress to do in the 21st century what it did in the 18th, 19th and 20th centuries by having a visionary approach to using Federal property that all of us own to advance education. To be very specific, I would urge that the Markey bill be adopted by the Congress.

Mr. SHIMKUS. What bill?

Mr. MARKEY. Markey-Shimkus bill.

Mr. MINOW. Excuse me. Incidentally, Congressman Shimkus, when you asked me the question about the businesses involved; the Internet, as you know, was invented by the Department of Defense, not by Al Gore. But the people who developed it were private industry, and that is the same thing that will happen here.

Mr. SHIMKUS. Thank you.

Mr. MARKEY. Thank you. And I thank each one of you. And I think you are right, Mr. Minow. It is a real challenge to this committee and to this Congress as to whether or not we have the vision to put in place policies that will serve generations yet to come. And I hope that we are up to the challenge about it. We thank each of you for coming here today.

Mr. WALDEN. I want to thank our witnesses. Thank you for your participation, your testimony. And our members for participating. And we are adjourned.

[Whereupon, at 11:59 a.m., the subcommittee was adjourned.]